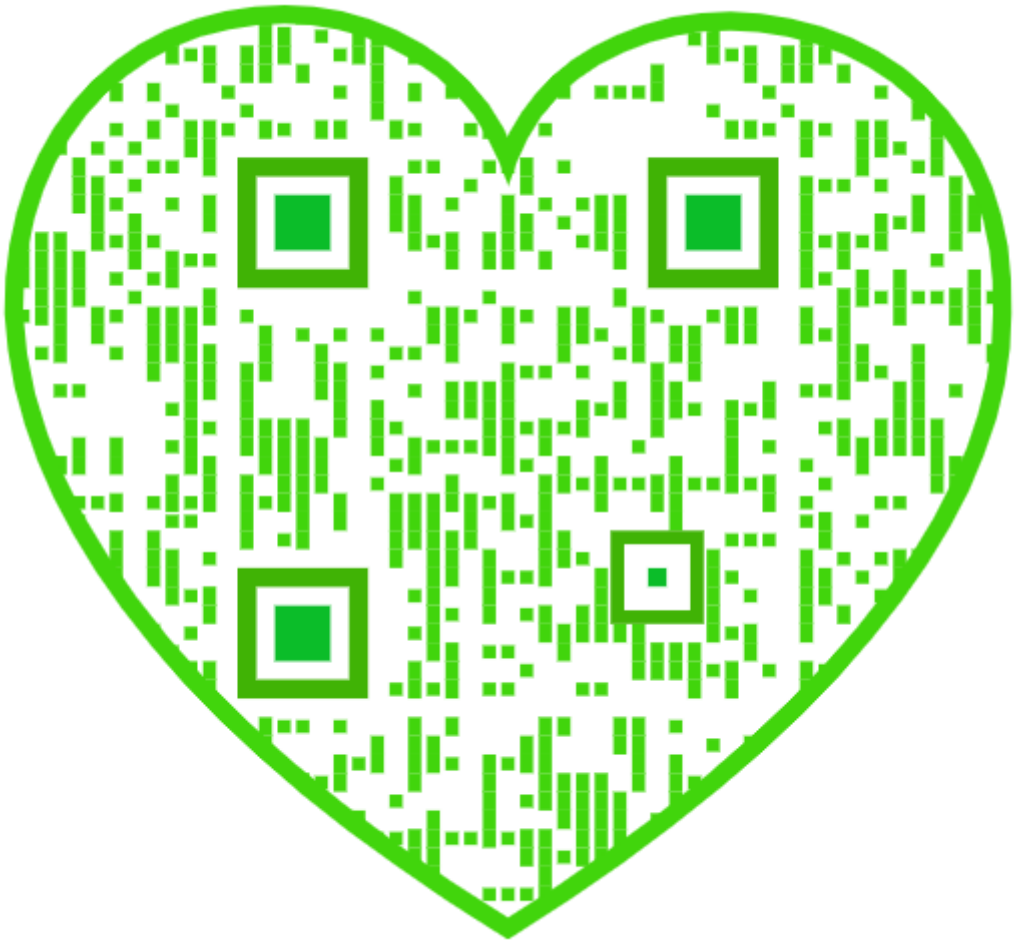

ESSENTIALS *of* GEOGRAPHY

GEOGRAPHY *of* NEW ENGLAND

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GEOGRAPHY OF NEW ENGLAND
E. P. 1

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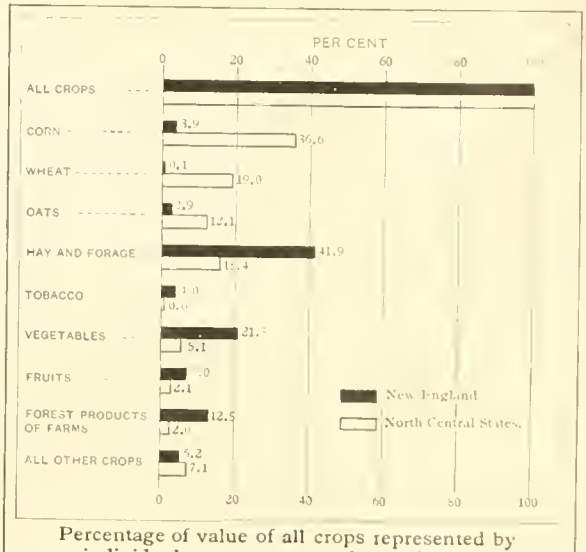
A typical New England landscape

GEOGRAPHY OF NEW ENGLAND

Surface.—Most of New England is an upland into which the streams have cut deep valleys. In the northern part the surface is mountainous, and the sides of the mountains are extensively covered with forests. The surface of New England is dotted with numerous lakes, and there are many swift-flowing rivers.

Study again Sections 78–82, 85, and answer the following questions: (1) What changes in the soil and surface of New England were made by the ice sheet that formerly moved southward over this region? (2) Where is the chief lowland in New England? (3) Where are the mountainous areas? (4) What and where is the highest mountain? (5) What are drowned valleys? Name and locate three in New England.

Agriculture.—The surface of New England is adapted to the growing of hay and pasture grasses. Because of the large number of people in villages and cities there is an enormous demand for milk and other dairy products. This demand and the large acreage of hay and pasture have led to the extensive development of dairying in New England. The many villages and cities create an extensive market for vegetables and fruits, and much tillable land is occupied by truck farms on which these products are grown. The diagram below shows the difference between the character of New England agriculture and that of the North Central section, which is the chief grain-growing region of the United States. Each line shows what per cent of the total value of all crops each crop or group of crops represents. For example, the value of corn in the North Central States is 36.6 per cent of the value of all the crops grown in that section, while the



Percentage of value of all crops represented by individual crops or group of crops in New England and North Central states

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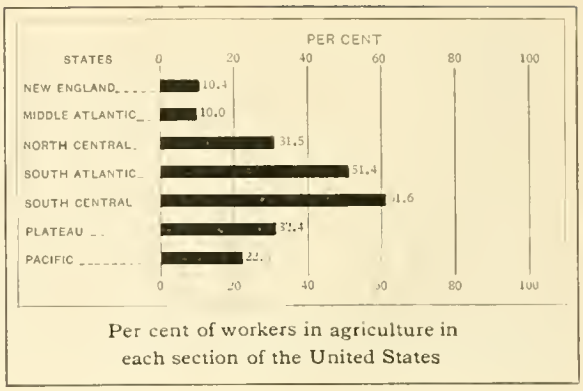
value of the New England corn crop is only 3.9 per cent of the value of all crops grown in that region.

The diagram to the right shows the per cent of workers engaged in agriculture in New England, and in each of the other sections of the United States.

New England as a Summer Resort.—Beautiful scenery, pleasant summer weather, and interesting historic places are the chief attractions that draw hundreds of thousands of summer visitors to New England. Rocky shores and sandy beaches, forest-covered mountains, grassy slopes, clear lakes, and swift-flowing rivers are some of the scenic features of this region. Many fine hotels and thousands of homes in the villages and on the farms care for the hosts of summer visitors.

Study Section 96 and answer the following questions: (1) What are some of the attractive features of the New England coast? Name two of the most important seaside resorts in New England. (2) Why do many people spend their summer vacations in the mountains? (3) Name several lines of employment in the tourist industry of New England.



Per cent of workers in agriculture in each section of the United States

Manufacturing.—New England is the chief manufacturing section of the United States. One of the diagrams on the next page shows the importance of this industry in New England. One half of all the workers in this section are engaged in manufacturing. Compare this with the per cent of workers engaged in manufacturing in the South Central section, where agriculture is the chief industry and manufacturing is of minor importance. Manufacturing requires that the workers live near the factories; and, therefore, more than four fifths of the people of New England live in cities and villages having 2500 or more inhabitants. The other diagram on the next page shows the per cent of urban and rural population in New England and in each of the other sections of the United States. Urban population consists of people living in cities and villages having 2500 or more inhabitants. Rural population consists of people living in the country and in cities and villages having less than 2500 inhabitants.

A typical farm scene in New England

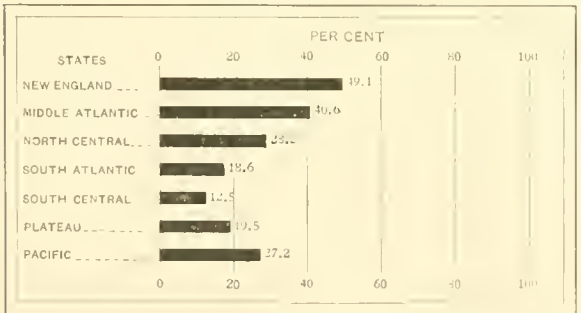
Read again Sections 87–92, and

Mount Washington and other peaks of the White Mountains

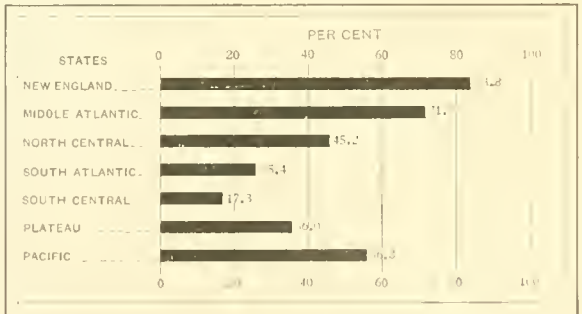
answer the following questions: (1) What things have made manufacturing the leading industry in New England? (2) Name and locate ten of the leading manufacturing cities of this section. (3) What are the leading manufactured products of New England?

Commerce.—The chief articles shipped out of New England are the products of its factories and quarries. Raw materials and fuel for the factories and foodstuffs for the million of people in the industrial centers are the leading products shipped into this region. Read Sections 87–99 to find answers to the following questions: (1) What are the two chief sources of power for manufacturing in New England? (2) Make a list of raw materials shipped into New England for its factories. (3) What countries or regions are the chief producers of each of the leading raw materials? (4) What manufacturing industry of New England obtains much of its raw material in that section? (5) Which city of New England is the chief market for hides and leather? (6) What things have helped to make Boston the leading seaport of New England?

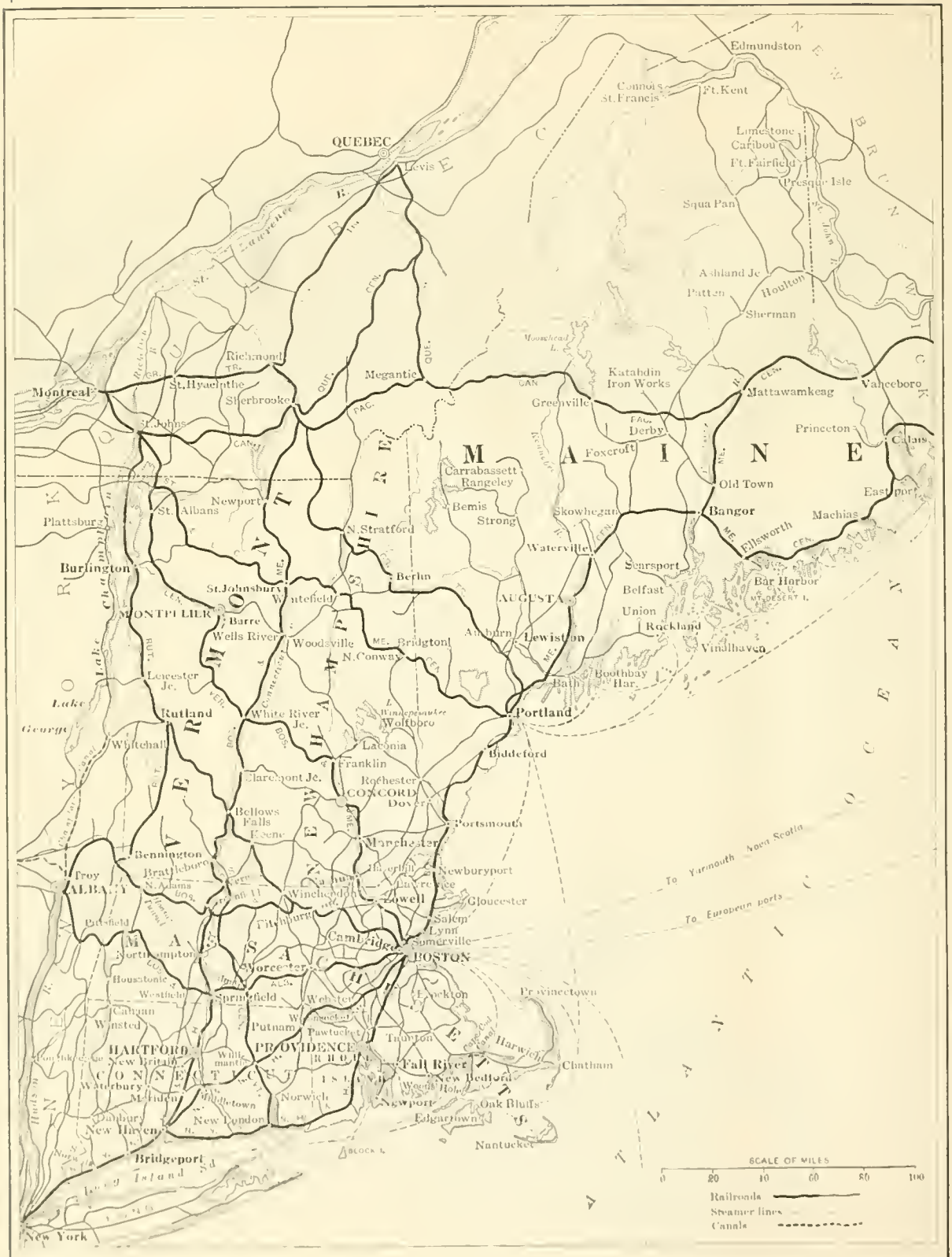
On the map on the following page notice how the railroad lines from all the New England states converge at Boston. Trace the railroad route from your home to one or more of the following places: Boston, Portland, Manchester, Burlington, Providence, and Hartford. Trace a railroad from Burlington, Vermont, to New London, Connecticut; from New Haven, Connecticut, to Bangor, Maine.



Per cent of workers engaged in manufacturing in each section of the United States



Per cent of urban population in each section of the United States



Transportation map of New England

Surf on the coast of Maine, Sutton's Island

GEOGRAPHY OF MAINE

By Edward E. Philbrook
Professor of Geography, Eastern State Normal School, Castine, Maine

HISTORY

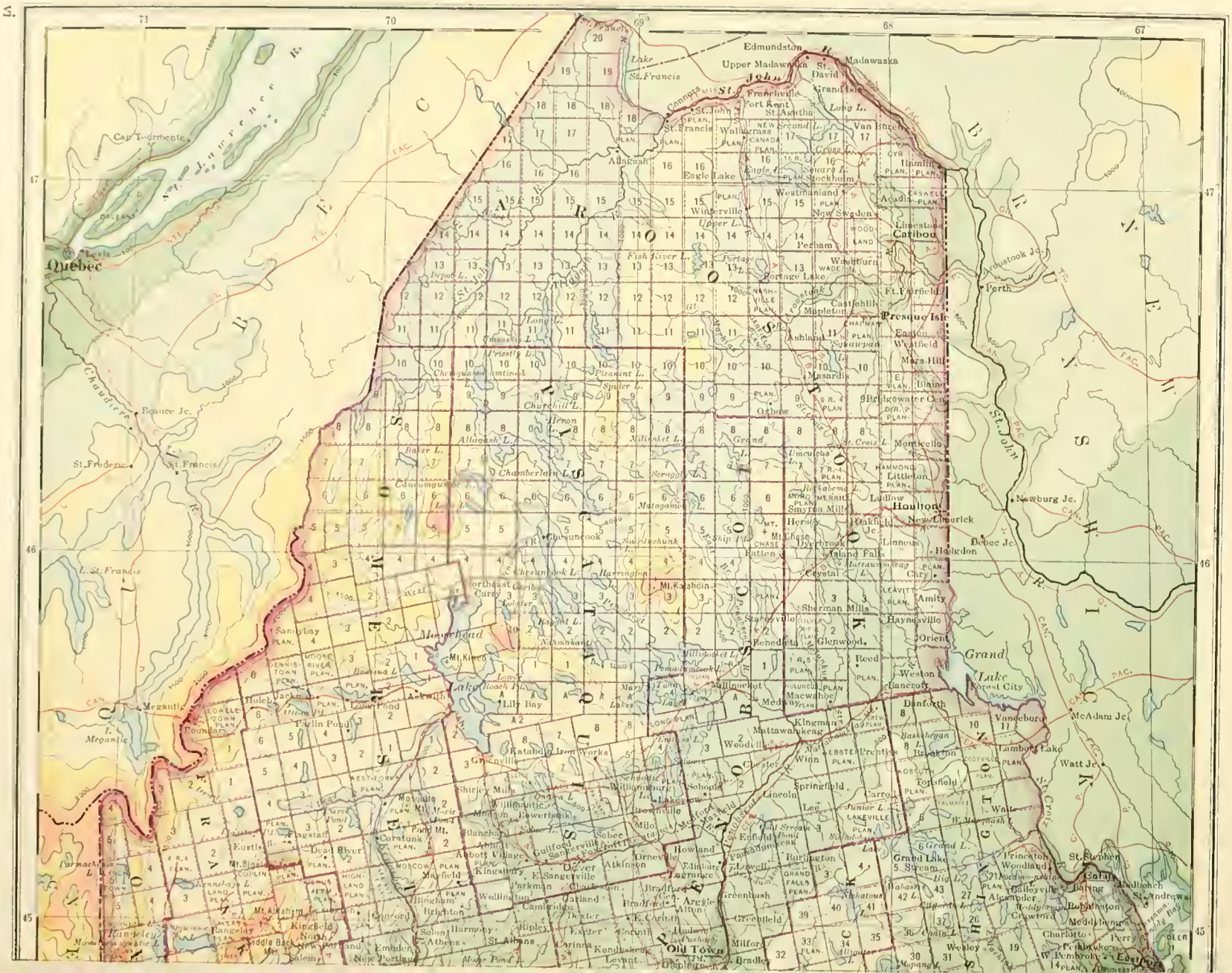
The first English settlement in Maine was established in 1607, at "Sagadahock," on the western side of the entrance to the Kennebec River, under charge of George Popham and Raleigh Gilbert, a brother of Sir Humphrey. The first winter was severe and many settlers died, so the survivors returned to England the following summer. In 1622 a permanent settlement was made at Monhegan and the next year one was made at Saco.

In 1622 John Mason and Ferdinando Gorges received from the English king a grant of land lying between the Merrimac and Kennebec rivers. In 1629 this territory was divided between the two, Gorges receiving the part which lies between the Piscataqua and the Kennebec. In 1639 he obtained a charter from the king which gave him almost absolute authority over the province.

In 1652 Maine came under the control of the Massachusetts colony. From this time Maine was governed from Boston until 1820, when it was admitted to the Union as a state.

The boundary between Maine and Canada was a subject of dispute for many years between the United States and Great Britain, and was not finally settled until 1842.

During the period of the Colonial wars Maine suffered much from the Indians, but after the Treaty of 1783, the settlement of this region steadily progressed. Emigration was especially active from the coast region of Massachusetts to the shores of Maine. The irregularity of the coast line made summer voyages in small craft easy and safe, while the prolific sea life insured abundant and wholesome food. Thus the islands and the coast are the oldest settled portions of the state.


Quebec
Levis
Cap Tourmente
St. Lawrence R.
Beauce Jc.
St. Frederic
St. Francis
L. St. Francis
Megantic
L. Megantic
Lake Aroostook
Mt. Kineo
Moosehead Lake
Lily Bay
Mt. Kineo
Mt. Kineo
Mt. Katahdin
Northeast Carry
Carry
Chesuncook
Chamberlain L.
Allagash L.
Eagle Lake
Allagash
Fish River L.
Portage Lake
Long L.
Priestly L.
Spider L.
Churchill L.
Heron L.
Baker L.
Matagamon L.
Millinocket L.
Grand L.
Umcolcus L.
Rockabema L.
Seboomook L.
Ship Pond
Second L.
Square L.
Eagle L.
Upper L.
Pleasant L.
Long L.
Caribou
Presque Isle
Houlton
Woodland
Old Town
Orono
Bangor
Dover
Foxcroft
Guilford
Sangerville
Milo
Brownville
Lincoln
Springfield
Carroll
Lee
Burlington
Howland
Enfield
Greenbush
Old Town
Milford
Bradley
Orrington
Brewer
Eddington
Holden
Hampden
Winterport
Frankfort
Searsport
Belfast
Northport
Lincolnville
Camden
Rockland
Thomaston
Owls Head
Vinalhaven
North Haven
Isle au Haut
Deer Isle
Stonington
Castine
Penobscot Bay
Penobscot R.
Kennebec R.
Moosehead L.
Sebec L.
Schoodic L.
Pushaw L.
Alamoosook L.
Great Pond
Mattawamkeag L.
Mattawamkeag
Haynesville
Orient
Amity
Sherman Mills
Benedicta
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Reed Plt.
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Danforth
Vanceboro
McAdam Jc.
Watt Jc.
Grand Lake Stream
Princeton
Calais
St. Stephen
St. Andrews
Robbinston
Eastport
Lubec
Machias
Machiasport
Jonesport
Beals
Cherryfield
Harrington
Milbridge
Steuben
Gouldsboro
Sullivan
Hancock
Ellsworth
Surry
Blue Hill
Brooksville
Deer Isle
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Belfast
Northport
Searsport
Frankfort
Winterport
Hampden
Holden
Eddington
Brewer
Orono
Old Town
Milford
Bradley
Orrington

Map Study. — 1. What is the approximate longitude of the most eastern part of Maine? Of the western boundary?

2. What is the approximate latitude of the southwestern corner of Maine? Of the most northern point of Maine?

3. What two rivers form part of the boundary between Maine and New Hampshire? 4. What rivers form part of the northern boundary? 5. What rivers form part of the eastern boundary?

6. What Canadian provinces border Maine?

7. Name five mountains in Maine.

8. What is the largest lake? 9. Name four other lakes.

10. Name four bays on the coast.

11. What is the largest island off the coast? 12. What islands are in Penobscot Bay? 13. What large city is on Penobscot Bay? 14. What large city is on Penobscot River? 15. Name two cities on Androscoggin River. 16. Name two cities on Saco River. 17. What is the capital of the state?

18. How many counties are there in the state? 19. Which is the most northern county? 20. Which two counties lie next to New Hampshire?

POSITION AND SIZE

Maine is the most northeasterly of the United States. South of it is the Atlantic Ocean, and Canada lies on the east and north, and more than half of the western frontier.

Maine lies between 43° 6′ and 47° 27′ 33″ north latitude and between 67° and 70° 37′ west longitude.

A railway journey from Kittery by way of Portland and Bangor to Fort Kent occupies about 18 hours.

The area of Maine is about one half that of New England as a whole. Of the total population of the six states, Maine has only about one eighth.

Among all the states of the Union, Maine ranks thirty-ninth in size, being about twenty-six and one half times larger than Rhode Island, the smallest state; while Texas, the largest, has room within its limits for about eight states of the size of Maine (Sec. 84).

RELIEF AND DRAINAGE

From the White Mountains of New Hampshire the mountain belt of the Appalachian Highland extends through northwest Maine, thus making this part of the state a very rough region. Mt. Katahdin (5385 ft.), one of the peaks of this mountainous section, is the highest point in the state. Situated in this belt are many of the large lakes of the state. That part of the state which lies to the southeast of the mountainous region is an upland which slopes toward the ocean.

The surface of Maine has been extensively eroded by the great ice sheet of the glacial period which moved over this region from north to south. After the ice melted away it left a layer of glacial drift spread out over most of the surface. In the valleys the deposits of drift are deep. On the sides of hills and mountains the layer of drift is thin, and many of the highest parts are bare. In places the drift is piled up in moraines and rounded hills called kames. In many places the glacial drift dammed the valleys, forming numerous lakes and diverting the streams from their old courses. In the new courses of the rivers are many falls which furnish a large amount of water power. Thus some of the most beautiful and most useful features of Maine are due to glacial ice.

After the moving ice sheet had deepened and widened the valleys, the land lowered so that the sea entered them, forming the many drowned valleys along the coast. The highest points of land between the valleys were not entirely covered by water, and they stand to-day above the level of the sea as islands. The broken surface of the coast region has formed many fine harbors on which are situated most of the large cities of Maine. The wonderful beauty of most

Bar Harbor, from Malvern Hill

of the coast of Maine has contributed largely to its popularity as a summer resort (Fig. 109). The distance in a straight line from the southwest extremity of the coast to its southeast limit is about 218 miles, but due to its great irregularity the total length of the coast line is over 2500 miles.

The largest rivers of Maine are the Saco, Androscoggin, Kennebec, Penobscot, Machias, and the St. Croix, which forms part of the eastern boundary of the state. Most of the northern part of the state is drained by tributaries of the River St. John. Of these tributaries the Aroostook is the largest. The Penobscot and the Kennebec are the most useful for shipping.

Maine has thousands of lakes and ponds, which vary in size from hundreds of square miles to a few acres. Moosehead is the largest. These beautiful lakes and streams attract thousands of visitors to the state each year (Figs. 87, 101).

Questions and Exercises. — 1. What part of Maine is mountainous? 2. What and where is the highest mountain of the state?

3. What surface features are due to the ice sheet that once covered the state?

4. Account for the irregular coast line of Maine.

5. What surface features have much to do in making Maine a great summer resort?

6. What uses are made of the rivers of Maine?

7. In the drainage basin of what river is your home located?

CLIMATE

Maine lies in the region of the prevailing westerlies, as may be seen in fine weather by the majestic procession of high clouds from west to east (Sec. 29). Many of the cyclonic storms of the westerly winds pass over Maine and bring frequent changes of weather. In summer the temperature is delightful, but in winter the cold is often intense. The cool summers help to attract thousands of tourists to the state every year.

Due to the prevailing winds, the ocean does not have a great influence on the climate of Maine. However, its influence is felt in a narrow belt along the coast. Here the summers are cooler and the winters are milder than they are in the interior of the state.

The growing season in Maine varies from about 150 days along the coast to about 120 days in the northern part (Fig. 71).

Along the coast of Maine the annual rainfall is about 45 inches, in the middle belt of the state it is about 40 inches, and in the northern part it is about 35 inches. It is distributed somewhat evenly through the year, and long droughts are practically unknown.

Questions and Exercises.—1. From what direction do the prevailing winds blow in Maine?

2. What part of Maine has the greatest rainfall? What part has the least rainfall?

3. What influences does the ocean have upon the climate of Maine?

4. What kind of climate would Maine have if the prevailing winds came from the ocean?

5. What is the length of the growing season along the coast of Maine? In the northern part of the state?

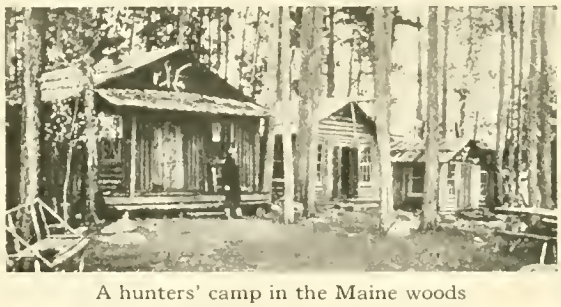
Kidney Pond and Mount Katahdin

MINERALS

Granite is the most valuable building stone in Maine. Occurring as it does on the coast, as at Vinalhaven and Stonington, and on the rivers, as at Hallowell and Frankfort, the problem of transportation to distant markets is solved by the use of the sea.

Slate for roofing and other uses is found in Piscataquis County, in the towns of Monson, Brownville, and Blanchard.

Limestone is found in many parts of Maine, but the best rock for lime making is found in Knox County, centering in the city of Rockland and the towns of Thomaston, Rockport, and Camden. The shipment of lime is greatly facilitated by nearness to good harbors.



A hunters' camp in the Maine woods

Clay for brickmaking is found in nearly every part of the state.

Oxford County furnishes valuable tourmalines, beryls, and amethysts (Sec. 94).

FISH AND GAME

In the early days of settlement, the rivers, the shore line, and the off-shore waters of Maine teemed with the most valuable of sea foods. Salmon and shad, during the spawning season, swarmed in the Kennebec, Penobscot, and other streams. Clams, scallops, and lobsters insured to the first settlers an abundant food supply, and cod, haddock, and mackerel were caught in unlimited numbers a few miles off the coast.

Reckless fishing has almost ruined these important industries. For example, herring are in danger of becoming extinct, yet sardines (small herring) are still packed to a larger extent in Maine than in any other region of the United States. The state government is trying to regulate fishing, and with the help of the National Government, to restore this source of food by restocking the waters with fish and lobsters.

The chief fishing centers are Portland, Boothbay Harbor, Rockland, Vinalhaven, Mount Desert, and Eastport.

The vast Maine woods are one of the greatest game regions in America. The hunter of moose and deer is sure to find those animals with now and then a bear, and the innumerable lakes and streams yield an abundance of fish to the skillful angler.

AGRICULTURE

The soils of Maine are of glacial origin. The upland have a thin and comparatively barren soil, and in places the surface consists of bare rock. The belts of alluvial soil in the river valleys are the best agricultural districts in the state. The valley of the Aroostook is one of the largest areas of fertile farm land in New England.

About one third of the land surface of Maine is in farms and about two fifths of the farm land is improved. A large part of northern Maine is still in woods and very little of the surface has been cleared for farming.

The leading field crops of Maine are hay, potatoes, oats, and corn. Apples are the chief orchard fruit, and strawberries are the most important of the small fruits. Peas and beans grow well, and buckwheat and barley are raised to some extent. Hay is the chief crop and grows well in all parts of the state. Most of the potatoes are grown in the Aroostook valley, although they grow well in other sections of the state. Maine ranks fourth in the yield of potatoes, being outranked by New York, Michigan, and Wisconsin. In yield

Making hay, Houlton

of potatoes per acre Maine ranks first. In the northern part of the state the growing season is too short for the successful raising of corn. The production of this crop to-day is only about half that of thirty years ago. The value of sweet corn raised for canning far exceeds that of field corn. Very little wheat is grown, and the state draws upon other states, chiefly those of the Middle West, for its supply of flour.

Many of the hillsides in Maine are well adapted to apple growing, the possibilities of which have hardly begun to be realized.

Owing to the distance from large markets, Maine does little truck farming.

Hay, potatoes, and apples are the chief farm products exported from the state.

The most important farm animals of Maine are horses, cattle, poultry, sheep, and hogs. The raising of poultry is increasing, while that of sheep and hogs is decreasing. The chief animal products sold from the farms of the state are eggs and butter.

Questions. — 1. Where are the most fertile areas of the state?

2. What are the leading crops of Maine?

3. Where is the great potato-growing area of the state?

4. What are the chief animal products of the farms of Maine?

MANUFACTURING

The leading manufactured products of Maine are wood pulp and paper, lumber and other wood products, cotton goods, woolen goods, boots and shoes, and canned goods.

The forests of Maine furnish the raw materials for the two leading manufacturing industries. In the northern part of the state are great areas of forests suitable for lumber-

A field of potatoes in the Aroostook Valley

A hydraulic power plant in Maine

ing operations. The most important trees of Maine are white pine, spruce, fir, hemlock, larch, white cedar, and birch. From spruce and other woods with long fibers the pulp and paper mills turn out an annual product of more than $20,000,000 in value. The largest pulp and paper mills are located at Rumford, Millinocket, Winslow, Woodland, Jay, and Madison (Secs. 92, 93). The value of the products of the sawmills and wood-working plants ranks next to that of the pulp and paper mills. Bangor is the leading center of lumber manufacture.

The manufacture of cotton goods ranks third among the manufacturing industries of Maine. Lewiston, Biddeford, Augusta, and Waterville are the chief centers of this industry. Woolen goods are made at Sandford, Lisbon, Skowhegan, Pittsfield, Dexter, and many smaller towns. Auburn is the leading center in the manufacture of boots and shoes.

Maine is one of the leading states in the canning industry. The principal branch of this industry in Maine is the canning of fish and clams. Maine cans about nine tenths of the sardines canned in the United States. Eastport is the chief center of sardine canning. Sweet corn is the most important vegetable canned, and in the production of canned corn Maine stands second, Illinois being first. An important industry in Aroostook County is the manufacture of starch from potatoes. Maine produces four fifths of all the potato starch made in the United States, and three fourths of this is made in that county.

The rivers of Maine with their many falls and rapids furnish a large amount of water power. Although the larger part of its water power is undeveloped, Maine ranks third among the states in the utilization of this source of energy. Water power is being used for the development of electrical energy which is used in propelling trains, lighting towns, and driving machinery in factories. Water power has located many of the woolen towns; and many of the pulp and paper mills and cotton mills are located at waterfalls.

Questions and Exercises.—1. Name the most important manufactured products of Maine. 2. Which of the leading industries obtain their raw materials from the state?

3. Make a list of the wood products that are manufactured in the state. 4. What cities are important centers of pulp and paper making?

5. Name several cotton-manufacturing centers.

6. Account for the importance of starch manufacturing in Aroostook County.

A wood-pulp mill in Maine

TRANSPORTATION

Maine lies on the ocean and has abundance of excellent harbors practically free from obstruction by ice. Every part of the shore line is in connection by steamer with Portland, Boston, New York, and the ports of the maritime provinces of Canada, making the coasting schooner almost a thing of the past. Regular lines of steamers for passengers and freight between Boston, Portland, Bath, Bangor, and Eastport are able to compete successfully with the railroads running along the shore.

Vessels taking on cargoes of lumber, Bangor

The first railway connecting Boston and Portland by way of Portsmouth, New Hampshire, was built in 1842. From Portland, lines were gradually extended northward and eastward, following mainly the valleys of the Androscoggin, Kennebec, and Penobscot rivers. The northern part of Maine was brought in direct touch with the coast when the Bangor and Aroostook Railroad was built. In 1893 this road reached Houlton, and in 1902 extended to Fort Kent at the northern border of the state.

Nearly all of the railroad mileage of Maine belongs to the following railroads: Maine Central, Boston and Maine, Bangor and Aroostook, Grand Trunk, and Canadian Pacific. The Maine Central Railroad connects the coast cities, and branch lines following the river valleys northward bring the interior of the state in touch with the coast. One line of the Maine Central runs northward from Portland through New Hampshire to the Connecticut Valley. The lines of the Boston and Maine connect Portland and other points in the southwestern corner of Maine with Portsmouth, Dover, Boston, and other cities to the west and the south-

Portland Harbor

west. The Bangor and Aroostook Railroad extends northward from Searsport and Bangor to the Aroostook Valley and other sections of northern Maine. The Grand Trunk extends from Canada through Vermont and New Hampshire to Portland. The Canadian Pacific crosses the state from east to west, passing through Boundary and Vanceboro and along the southern shore of Schoodic and Moosehead lakes.

Hubbard Hall, Bowdoin College

Questions.—1. Name the most important railroads of Maine.

2. Through what cities do you pass in traveling from Portland to Eastport?

3. Trace the railroad route between Fort Kent and Searsport.

4. What transportation lines connect Portland with other cities of New England?

GOVERNMENT AND EDUCATION

Government.—The legislature of Maine consists of a senate of 31 members and a house of representatives of 151 members. Members of the legislature are elected by the people for a term of two years. The sessions of the legislature are held biennially, in odd-numbered years.

The executive department is vested in a governor, elected by the people for two years, at the same time as the election of the legislature. When the legislature meets, it chooses, by joint ballot, a council of seven men, who are the official advisers of the governor. The legislature, also by joint ballot, chooses a secretary of state, a state treasurer, an attorney general, and a commissioner of agriculture. The other officers of this department are appointed by the governor, with the advice and consent of the council.

At the head of the judicial department is the supreme judicial court, consisting of a chief justice and seven associate justices, appointed by the governor and council for seven years. In Cumberland and Kennebec counties are superior courts with judges appointed in the same way as the judge of the supreme court. There are also lesser courts presided over by police and municipal judges and trial justices.

The county has a relatively subordinate part in local affairs. The sheriff and county attorney are county officials and are elected by the people of each county. The counties are divided into towns, many of which have been incorporated as cities. The town is the initial unit of government in Maine. In the open town meeting is found the nearest approach to a purely democratic form of government. The city is a representative type of government, in which the people give over direct part in the administration of affairs to a mayor, a board of aldermen, and a common council; sometimes this second body is dispensed with, eight of the twenty cities in Maine having only a board of aldermen, the others having both.

The capital of Maine is Augusta.

Maine is represented in Congress by two senators and four representatives.

Education.—In nearly all towns of Maine, children have the privileges of over thirty weeks of school in a year. The towns are required by law to furnish free textbooks to all pupils. The teacher in the public school must be at least seventeen years of age, must have completed a standard high school or academy course, and must hold a state certificate. A state law makes possible the superintendence of all common schools by trained men.

The secondary schools had their beginning in the academies, of which now forty-eight

are helping to educate the youth of the state. These are supplemented by free public high schools in all the cities, the larger villages, and many of the towns.

For the training of teachers the state maintains five normal schools, located respectively at Farmington, Castine, Gorham, Presque Isle, and Machias. The state maintains also the Madawaska Training School at Fort Kent.

Institutions of higher learning are the following: Bowdoin College at Brunswick, Colby College at Waterville, Bates College at Lewiston, and the University of Maine at Orono.

State highway, Portland

POPULATION AND CITIES

The population of Maine in 1910 was 742,371, of whom about one half lived in the cities and larger villages and about one half in rural territory. Of the population of Maine 66.7 per cent are native whites of native parentage, 18 per cent are native born of foreign parentage, while only 14 per cent are of foreign birth.

Portland, the largest and most important city in Maine, is distinctly commercial in its origin, being located on one of the best harbors on the North Atlantic coast. The Grand Trunk Railway of Canada brings its winter business to Portland and it is the only city of New England, outside of Boston, having regular transatlantic lines of steamers. In value of manufactured products it ranks first in the state. The city has a beautiful location, and is well kept.

Lewiston, on the Androscoggin River, is the second city in size. The falls here afford a large amount of power that has been utilized by the industries of the city. Its chief industry is the manufacture of cotton cloth. Other manufactured products are woolen cloth, lumber, flour, boots and shoes, and machinery. The city also has large bleacheries and dye works.

Bangor, at the head of navigation on the Penobscot River, is the chief center of the lumber industry. The Penobscot and its tributaries bring to the city enormous numbers of logs from the forest of northern Maine. Thus situated at the tidewater outlet of a great lumbering region, this city is one of the greatest lumber markets of the world. In addition to the many sawmills, Bangor has shoe factories, trunk factories, and wool-pulling carding mills. Near the city are large pulp and paper mills.

Biddeford is situated on the Saco River, six miles from the sea. The falls of the Saco furnish a large amount of power for manufacturing. The chief manufactured products are cotton cloth, lumber, and machinery. Near the cities are large granite quarries.

Auburn, situated on the Androscoggin, opposite Lewiston, is the chief city of Maine in the manufacture of boots and shoes. Other manufactured products are cotton goods, lumber, wooden boxes, and carriages.

Augusta, the capital, is situated on the Kennebec at the head of navigation. Water power from the falls of the river is used in the manufacture of cotton goods, wood pulp and paper, and other products. Printing and publishing is the most important industry. The granite in the state capitol came from quarries near the city.

Waterville, on the Kennebec, has large cotton and woolen mills, car shops, flour mills, and sawmills. In **Winslow**, opposite Waterville, are pulp and paper mills. Colby College and the Coburn Classical Institute are located in **Waterville**.

General Review.—1. Describe the surface of Maine.

2. Account for the many waterfalls of the state.

3. What conditions make the state so desirable as a summer resort?

4. Make a list of the agricultural, mineral, marine, and manufactured products of Maine.

5. Why is Maine not a great grain-growing state like those of the North Central group?

6. What are the two most important manufacturing industries of the state? Account for their importance.

7. What manufacturing industries of the state are located in the large cities? Why?

8. Locate the ten largest cities of Maine.

TABLES

Table I.—Counties of Maine

County	Area	Population 1910	Shire Town
York	989	68,526	Alfred
Lincoln	457	18,216	Wiscasset
Cumberland	853	112,014	Portland
Hancock	1,522	35,575	Ellsworth
Washington	2,528	42,905	Machias
Kennebec	879	62,863	Augusta
Oxford	1,980	36,256	Paris
Somerset	3,633	36,301	Skowhegan
Penobscot	3,258	85,285	Bangor
Waldo	724	23,383	Belfast
Franklin	1,789	19,119	Farmington
Piscataquis	3,770	19,887	Dover
Aroostook	6,453	74,664	Houlton
Androscoggin	459	59,822	Auburn
Sagadahoc	250	18,574	Bath
Knox	351	28,981	Rockland

Table II.—Population (1910) of Leading Cities and Towns

Portland (city)	58,571	Brewer (city)	5,667
Lewiston (city)	26,247	Caribou (town)	5,377
Bangor (city)	24,803	Skowhegan (town)	5,341
Biddeford (city)	17,079	Presque Isle (town)	5,179
Auburn (city)	15,064	Gardiner (city)	5,111
Augusta (city)	13,211	Eastport (city)	4,961
Waterville (city)	11,458	Belfast (city)	4,618
Bath (city)	9,396	Eden (town)	4,441
Sanford (town)	9,049	Fairfield (town)	4,435
Westbrook (city)	8,281	Fort Fairfield (town)	4,381
Rockland (city)	8,174	Lisbon (town)	4,116
South Portland (city)	7,471	Fort Kent (town)	3,710
Rumford (town)	6,777	Orono (town)	3,555
Brunswick (town)	6,621	Ellsworth (city)	3,549
Saco (city)	6,583	Kittery (town)	3,533
Oldtown (city)	6,317	Dexter (town)	3,530
Calais (city)	6,116	Paris (town)	3,436
Houlton (town)	5,845	Madison (town)	3,379

Table III.—Places whose Population was Estimated by U. S. Census Bureau in 1915

Portland	63,014	Augusta	14,015
Lewiston	27,557	Waterville	12,501
Bangor	26,360	Sanford (town)	10,615
Biddeford	17,570	Westbrook	8,807
Auburn	16,179	Rockland	8,184

Table IV.—Agricultural Products, 1910

Crops	Value	Leading County
All crops	$39,317,647	
Hay and forage	15,115,821	Aroostook
Potatoes	10,224,714	Aroostook
Oats	2,293,947	Aroostook
Corn	434,834	Oxford
Beans	275,334	Penobscot
Buckwheat	189,516	Aroostook
Wheat	91,554	Aroostook
Barley	86,230	Aroostook
Peas	10,134	Aroostook
Live Stock		
All domestic animals	$23,989,561	Aroostook
Horses	14,364,756	Aroostook
Cattle	7,784,384	Penobscot
Swine	948,094	Aroostook
Sheep	813,976	Kennebec
Poultry	1,131,921	Cumberland
Bees	40,357	Aroostook
Animal Products		
Dairy products	$8,079,692	Penobscot
Poultry and eggs	3,386,865	Cumberland
Wool	253,775	Kennebec
Honey and wax	20,686	Aroostook

Table V.—Leading Manufactures

	Number of Establishments	Value of Products
All industries	3,546	$176,029,000
Paper and wood pulp	45	33,950,000
Lumber and timber products	1,065	26,125,000
Cotton goods	16	21,932,000
Woolen goods	65	18,460,000
Boots and shoes	55	15,509,000
Canning and preserving	245	7,689,000
Foundry and machine shop products	125	5,237,000
Flour mill and grist mill products	173	4,507,000
Printing and publishing	195	3,438,000
Ship and boat building	156	3,062,000
Marble and stone work	142	2,565,000
Bread and other bakery products	186	2,235,000

GEOGRAPHY OF NEW HAMPSHIRE

By Wallace E. Mason
Principal, Keene Normal School, Keene, New Hampshire

HISTORY

Captain John Mason, an English merchant and shipmaster who at one time was governor of Portsmouth in Hampshire, England, is regarded as the founder of New Hampshire, naming the colony and its seaport after the English county and port.

In 1622 the land between the Merrimac and Kennebec rivers was granted to Mason and Gorges. In 1629 the grant was divided and Mason received the tract between the Merrimac and Piscataqua rivers. The first settlement within the area that is now New Hampshire was made near the mouth of the Piscataqua in 1623. About the same time Dover was settled; and Exeter was founded in 1633. In 1641–1643 New Hampshire came under the control of Massachusetts, but in 1680 it was separated from the Puritan colony and made a royal province. In 1689 New Hampshire again came under the control of Massachusetts and remained so until 1741, when it once more became a separate province.

Statue of General Stark, Concord

During the wars between the English and French, the settlements in New Hampshire were frequently attacked by bands of Indians from Canada. In the French and Indian War New Hampshire troops did valiant service in the English attacks upon the French in Canada. In this war Stark and many others received military experience which was of great value to the colonists during the Revolutionary War.

In 1775 New Hampshire declared her independence of Great Britain, and was the first colony to adopt a state constitution. The state was the ninth to ratify the Federal Constitution in 1788.

Questions.—1. When was your town founded? 2. From where did the early settlers come? 3. What historic buildings or monuments are there in your town? 4. What interesting historic events have taken place in your locality?

POSITION, FORM, AND SIZE

New Hampshire is the middle state of the northern group of New England states. It is triangular in shape and extends from latitude 42° 40′ N. to 45° 18′ N. The most eastern point of the state is in longitude 70° 37′ W. The most western point is 72° 37′ W. The western boundary of New Hampshire is the west bank of the Connecticut River.

The area of New Hampshire is 9341 square miles. It is 223 square miles smaller than Vermont, 1073 square miles larger than Massachusetts, and nearly eight times as large as Rhode Island. The greatest distance from north to south is 182 miles. The width of the state from the Atlantic coast to the Connecticut River is about 90 miles.

Presidential Range, from Bretton Woods. Mount Washington is the high peak near the middle

RELIEF AND DRAINAGE

An upland belt extends north and south throughout the full length of New Hampshire. The highest and most rugged portion of this upland region is known as the White Mountains. The name, White Mountains, however, is often applied to the whole of the upland belt. On the west side of the upland area is the Connecticut Valley; on the eastern side is a hilly lowland. Thus the state is divided into three belts, an upland and two bordering lowlands.

The highest part of the White Mountains is the Presidential Range. On this range are many high peaks, five of which are more than one mile above sea level. These are Mt. Washington, Mt. Adams, Mt. Jefferson, Mt. Monroe, and Mt. Madison. Mt. Washington, which has an elevation of 6290 feet, is the highest peak in the northern Appalachian highland. In the southern part of New Hampshire are several isolated peaks which rise considerably above the general level of the upland region. The most famous of these is Monadnock Mountain, which is 3166 feet above sea level.

The grandeur of the White Mountains combined with the charm and beauty of the lakes has given New Hampshire the name of "Switzerland of America." Thousands of people, attracted by its beautiful scenery and cool air, spend their summer vacation within its borders.

Monadnock Lake and Monadnock Mountain

Three deep passes in northern New Hampshire connect the Connecticut Valley with the lowland on the east side of the White Mountains. These have been carved out by the streams. The most southern of these passes has been formed by the Saco River and the Lower Ammonoosuc. The summit of the pass is at Crawford

House. It is the divide between the Saco and Gibbs Brook, which is one of the headwaters of the Lower Ammonoosuc. The part of the pass which has been cut by the Saco is a deep, narrow gorge, called Crawford Notch. The next pass is formed by the Moose and Israel rivers. The northernmost of these three passes is formed by the Androscoggin and Upper Ammonoosuc rivers. These passes serve as railroad routes through the mountains.

Crawford Notch

The entire surface of New Hampshire was covered with ice during the Glacial Period. The effects of the ice are evident in many parts of the state. The soil is of glacial origin, having been derived from the granite by the grinding action of the glacial ice as it moved southward. Glacial scratches are found on many of the uncovered ledges. Many bowlders are found in the state. These were torn loose from ledges in Canada and carried southward by the ice.

Questions.—1. What river drains Connecticut Lake? (See double-page map of New Hampshire and Vermont.) 2. On a map of New England trace the courses of the Androscoggin and Saco rivers to the sea. 3. What river drains Ossipee Lake?

4. Trace the course of the Upper Ammonoosuc from its source to its mouth. 5. Trace the course of the Lower Ammonoosuc. 6. What other tributaries of the Connecticut are in New Hampshire? 7. What river drains Lake Sunapee?

Centre Harbor on Lake Winnepesaukee

8. What two rivers unite to form the Merrimac? 9. Trace the limits of the area drained by the Merrimac. 10. Trace the course of the Contoocook River. 11. What river flows into the Merrimac at Nashua?

12. What rivers form part of the boundary between New Hampshire and Maine?

CLIMATE

New Hampshire has cold winters and mild summers. In winter 20° below zero is not uncommon, and 40° below zero is sometimes reported. In the northern part of the state, because of its greater elevation and latitude, the winters are more severe and the summers cooler than in the southern part. Along the coast the moderating influence of the ocean is felt for some distance inland.

The length of the growing season varies from 120 days in the northern part of the state to 160 days along the coast.

The average rainfall for the state is about 40 inches. On the mountains it is 50 inches or more. The rainfall is evenly distributed through the four seasons, although the summer has a little more rain than any of the other seasons. Injurious droughts are quite rare. The annual snowfall varies from four feet along the coast to eight feet in the northern part. On the mountains it is ten feet or more. In the northern part of the state there are usually four months of sleighing; in the central part, three months; and in the southern part, two months or less. The deep continuous snow of the northern section is of great benefit to lumbermen.

The prevailing winds of the southeastern part of the state are from the southeast. In the Connecticut Valley the prevailing winds are from the southwest.

FORESTS AND GAME

Forests. — About two fifths of the surface of New Hampshire is timber land. This area is so rugged that it is not suitable for agriculture and would be more productive if it were kept in forest. Much of the woodland has been deforested by methods of lumbering that destroyed the young trees, and large tracts have been denuded of trees by forest fires.

On the mountain slopes where the forests are cut down the soil is soon washed away by rain, and in a short time nothing but the bare rock is left. Then the steep slopes will not support even trees, and it becomes a desolate waste. Floods, too, are greater in mountain streams after the forests are removed than they were before. Forest removal also destroys the beauty of mountain scenery. In order to regulate the flow of water in streams, protect the soil against erosion, preserve the natural beauty, and insure a future supply of lumber, the Federal Government is buying large tracts of timbered land in the White Mountains and forming them into a national forest. The present national forest is about a quarter of a million acres and includes the slopes of Mt. Washington, Mt. Jefferson, and Mt. Adams. Crawford Notch is owned by the state.

The most important timber trees of New Hampshire are spruce, fir, pine, birch, maple, and beech. In the northern part of the state about one fifth of the land is still covered with virgin forests, and in these woodlands are most of the lumbering operations of the state (Fig. 104). The abundance of spruce in this region accounts for the rapid growth of Berlin, with its great wood pulp and paper mills. Second-growth pine provides raw material for many box factories over the state. Chair factories make use of birch and maple.

Questions and Exercises. 1. Make a collection of the various kinds of wood in your county. 2. What factories in your locality use wood? 3. What kinds do they use and what wood products do they manufacture?

Game. — The only large animals left in the woods of New Hampshire are bears and deer. The former are very scarce, but the latter are numerous, and they do a great deal

of damage to the young apple trees and growing crops. There is a short "open season" in the fall during which hunters who obtain a license are privileged to shoot deer. This brings a great many hunters into the state. Nearly every stream in the state offers good opportunities for trout fishing, while the lakes are visited every year by hundreds of sportsmen who secure fine catches of trout, bass, pickerel, salmon, and perch.

MINERAL WEALTH

The chief mineral wealth of New Hampshire lies in its deposits of granite. There are many quarries of this stone, the most important being near Concord, Milford, North Conway, and Fitzwilliam. The granite is used for monuments and buildings. The second largest granite-cutting shed in the United States is located at Keene. The Fitzwilliam granite is brought here for cutting.

In many parts of the state are beds of clay which is used mainly in the manufacture of brick. The principal brick-making plants are in Strafford and Rockingham counties.

New Hampshire is one of the leading states in the production of mica. Valuable deposits are found in Grafton and Cheshire counties. Other mineral products of the state are fluorspar, garnet, beryl, mineral waters, asbestos, talc, graphite, sand, and gravel.

AGRICULTURE

The surface of New Hampshire is too rugged to give the state a high place in agriculture. About three fifths of the area of the state is in farms, but only a small part of the land can be successfully tilled. Much of the surface is too steep and has too many bowlders for the use of farm machinery, and therefore most of the farm acreage is in meadow. The most fertile areas in New Hampshire are the belts of alluvial soil in the river valleys.

The leading crops of New Hampshire are hay, potatoes, corn, and oats. Hay is by far the most important crop of the state, while the grain crops are relatively unimportant. According to the census of 1910, the acreage of hay was sixteen times that of all the cereal crops combined, and the value of the hay crop was nine times greater than the combined value of the cereal crops. In much of the state the summer is too cool for corn. Potatoes, which thrive in a cool climate, do well in New Hampshire. The leading orchard fruits are apples, peaches, and pears. Strawberries

Harvesting hay, Derry

Dairy cattle

are the most important of the small fruits. The woodlots on New Hampshire farms yield maple sugar, firewood, posts, railroad ties, and many other forests products.

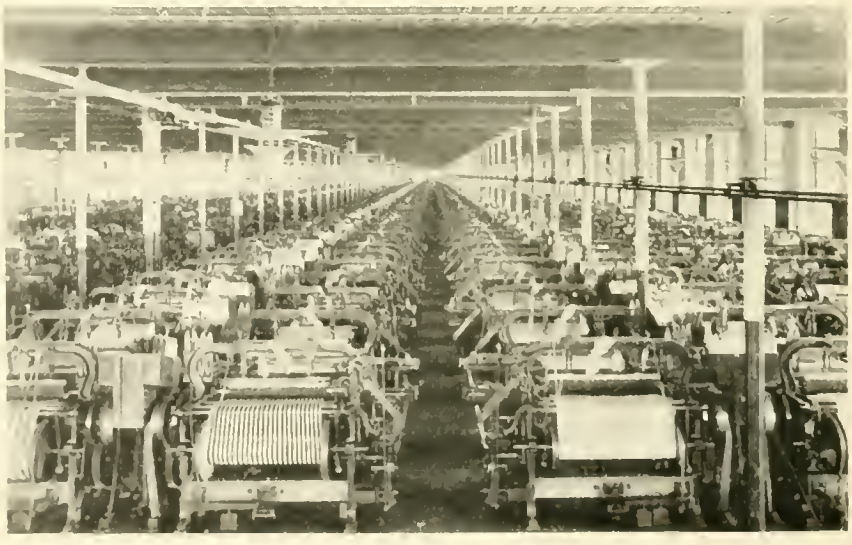
The chief farm animals are horses, cattle, hogs, sheep, and poultry. The most productive animals are dairy cattle, and dairy products form an important source of revenue, their value exceeding five million dollars annually. Milk from New Hampshire is shipped to many of the large cities of New England and to New York.

MANUFACTURING

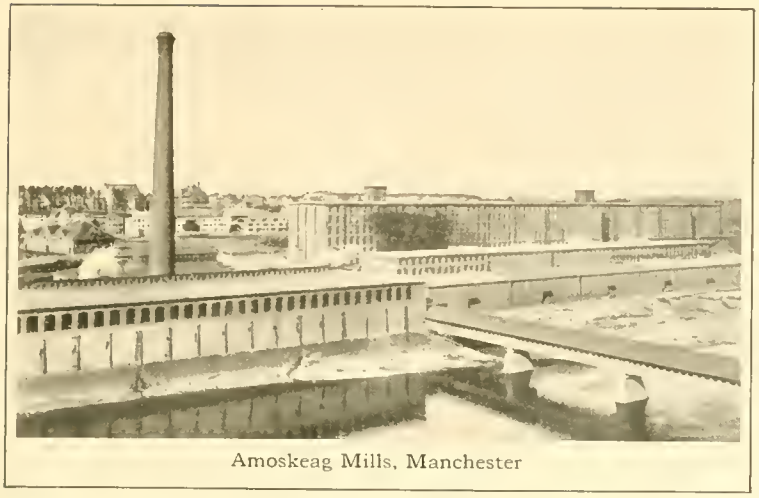
The chief manufacturing section of New Hampshire is the southeastern part of the state. The great water power of the Merrimac determined the location of the many manufacturing plants on its banks. The Amoskeag Falls at Manchester have a drop of 50 feet. At Laconia the river descends 150 feet in one mile. At Nashua splendid water power from the Nashua River is available. The falls on the Cocheco River at Dover provide power for large textile mills. Many other falls and rapids on the smaller rivers of the state furnish power for a large number of manufacturing plants.

The leading manufactured products are boots and shoes, cotton goods, woolen goods, lumber, and wood pulp and paper. Less important products are machinery, hosiery and knit goods, and flour.

The manufacture of boots and shoes and



Weaving room in a cotton mill, Manchester



Amoskeag Mills, Manchester

textiles began in the early days of New Hampshire; and although the factories are far from the source of the raw materials, these industries are able to maintain themselves successfully.

The mills engaged in the manufacture of lumber and wood pulp and paper are located in the northern part of the state, near the forests which furnish the raw materials of these industries.

The eight leading manufacturing cities of New Hampshire are Manchester, Nashua, Concord, Dover, Berlin, Laconia, Keene, and Portsmouth. Manchester stands far ahead of all the other cities, the value of its manufactures exceeding that of the seven other industrial centers.

Questions and Exercises.—1. Make a list of the factories in your town. 2. What raw materials do they use? 3. From where do the raw materials come? 4. What are the finished products of each factory? 5. To what places are they shipped?

ROUTES OF TRADE

The Boston and Maine railroad system has a number of railroads in New Hampshire; some of them cross the southeastern part of the state, connecting Portland and Boston; others from Portsmouth and Boston extend northwestward across New Hampshire to the Connecticut Valley, where they connect with lines leading to Lake Champlain and Montreal. Other lines of this system follow the Connecticut Valley southward into Massachusetts and northward into Canada.

The Maine Central runs northwestward from Portland, reaches the heart of the White Mountains by way of Crawford Notch, and continues to St. Johnsbury, Vermont, where it connects with railroads running to Lake Champlain and Montreal. The Quebec line of the Maine Central runs from Quebec Junction in New Hampshire to Quebec, Canada.

The Grand Trunk connecting Montreal with Portland, Maine, passes through the northern part of New Hampshire. It crosses the state by way of the Upper Ammonoosuc and Androscoggin rivers.

Portsmouth is the only seaport of New Hampshire. Large quantities of coal are brought by water to this city and distributed through the state by rail.

Questions and Exercises.—1. What are some of the most important goods shipped from your town? Into your town? 2. Trace the railroad route from your home to Portland, to Boston, to New Haven, to Montreal (See map, p. iv).

Portsmouth harbor

Science Building, New Hampshire College, Durham

GOVERNMENT AND EDUCATION

Government. — The Governor of New Hampshire is elected by the people for a term of two years. The Executive Council is an advisory body to the Governor. It consists of five councilors who are elected by districts. The Governor and Council appoint all judicial officers of the state. The state legislature, called the General Court, consists of a Senate and a House of Representatives, and meets once in two years. The senators and representatives are elected for a term of two years.

Questions and Exercises.—1. Write the names of the ten counties of the state in alphabetical order. 2. In which county do you live? 3. Where is the county seat?

4. Who is the representative from your town?

5. Who is the state senator from your senatorial district?

6. In which councilor district do you live? 7. Who is the councilor from your district?

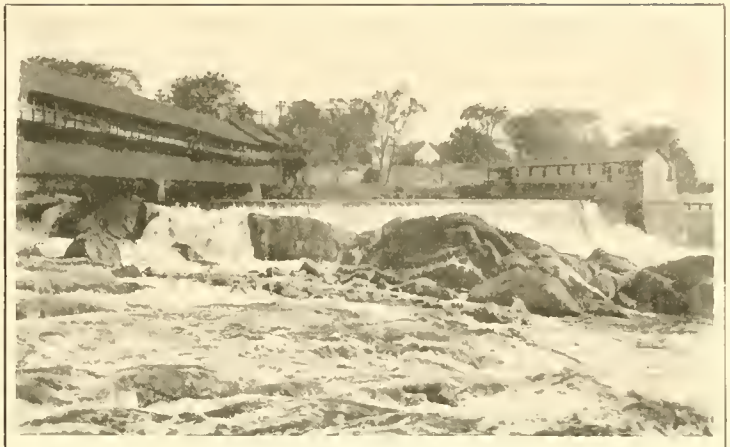
Education. —The superintendent of public instruction and three deputy superintendents have general supervision of education. They are appointed by the Governor. All of the cities and large towns have local superintendents. Two or more towns may unite in employing a superintendent, and the state pays one half of his salary if he holds a permanent state certificate. Attendance is required of all pupils until they become sixteen years of age unless they have completed the eight grades of school earlier. Towns are obliged to support high schools or pay tuition for their pupils elsewhere.

Dartmouth College at Hanover is one of the leading colleges in the United States. It was founded by Eleazer Wheelock in 1769, and was named after Lord Dartmouth, an English patron of the institution. The New Hampshire College of Agriculture and the Mechanic Arts is located at Durham. This state has two flourishing normal schools: one, located at Plymouth, was organized in 1871; the other, at Keene, was organized in 1909. Tuition in the normal schools is free to all who agree to teach in the public schools of the state, after graduation, for a period equal to the length of time spent in these institutions.

There are many private educational institutions, some of which are attended by pupils from all parts of the United States. Among the largest and best known are Phillips Exeter Academy at Exeter, St. Paul's school at Concord, and Tilton Seminary at Tilton.

Buildings of Dartmouth College, Hanover

CITIES



Amoskeag Falls, Manchester

Manchester, the largest city of the state, is in the valley of the famous Merrimac, at Amoskeag Falls. It is a city of straight, clean, shady streets, with a beautiful public library and many churches, schools, and hospitals.

The making of boots and shoes and the weaving of cotton goods are the two most important industries of the city. Other products of the factories are woolen goods, paper, knitting machines, bobbins, shuttles, and boxes. The raw materials for its most important industries, leather, cotton, and wool, are all brought from great distances, but in spite of this disadvantage, modern business methods have enabled the mills to retain their leadership and to constantly increase their output.

The State Industrial School is located in this city.

Nashua is the second city in size and is the center of six radiating lines of steam railroads. The manufacture of cotton goods is the chief industry of the city. Other products are boots and shoes, paper, machinery, tools, and furniture. The city has fine public buildings and parks.

Concord is the capital. Its beautiful buildings, residences, and churches make the city one of the most attractive in New England. The leading industry is the quarrying and dressing of granite, which has long been noted for its excellent quality as a building and monumental stone. The Congressional Library at Washington was made from Concord granite. Leather belting, silverware, cotton goods, woolen goods, and carriages are also among the manufactured products. The State Asylum for the Insane, the State Prison, and many public and charitable institutions are located here.

State House, Concord

Portsmouth was for many years the leading city until the development of water power from the Merrimac enabled the cities of that valley to surpass it. The most important industry is the manufacture of malt liquors. Other products are boots and shoes, iron castings, and bobbins. The Portsmouth Navy Yard, located on the other side of the river in Kittery, Maine, contributes greatly to the industrial life of Portsmouth. Formerly Portsmouth was an important shipbuilding city. The first battleship of the United States, the *North America*, was launched here in 1781, and the famous *Kearsarge* was also built in a Portsmouth yard. The city's location makes it a fine summer resort.

The Isles of Shoals, another summer resort, are reached by boat from Portsmouth.

Keene is the financial and business center of the southwestern section of the state. Granite cutting is the leading industry of the city. Other important products are chairs, other wood products, boots and shoes, woolen goods, brick, and mica products. The Keene Normal School, a rapidly growing institution, with the city schools as a practice department, makes Keene the educational center of this part of the state.

Berlin is situated in the valley of the Androscoggin River in the beautiful White Mountain region. The Androscoggin River furnishes a large amount of water power for the mills of this city. The Grand Trunk railway passes through the city. It is also a terminus of one of the lines of the Boston and Maine railroad. Situated near extensive forests, Berlin manufactures large quantities of lumber, wood pulp, and other wood products. Some of the largest wood pulp and paper mills in America are located in this city.

Dover, at the falls of the Cocheco and the Bellamy rivers, was one of the first permanent settlements of New Hampshire. It was long an outpost against hostile Indians, and one log garrison is still standing. The early settlers were employed in fishing, lumbering, and shipbuilding. The falls furnish excellent power for the production of woolen goods, cotton goods, shoes, and machinery. The foreign population includes a large number of people from the Mediterranean region. Dover is in the midst of a rich farming section.

Franklin is situated at the head of the Merrimac River. It has excellent water power which is used in the manufacture of woolen goods, hosiery, paper, and machine needles. This city is closely associated with the life of Daniel Webster. His birthplace was in Salisbury, which is now a part of Franklin. The house in which he was born has recently been restored to its original form, and is owned and maintained by the Webster Birthplace Association. The New Hampshire Orphans' Home is located in Franklin.

Rochester is situated in southeastern New Hampshire, near Dover and Somersworth. The Cocheco River flows through the city, and the Salmon Falls River passes along its southeastern border. These streams furnish considerable water power for the manufacturing establishments of the city. The chief industrial products are woolen goods, shoes, leatherboard, lumber, and brick. Rochester is an important railroad center, having direct lines to New York, Boston, Portland, and northern points.

Somersworth is situated on the Salmon Falls River about five miles above tidewater. The chief manufactured products of the city are cotton goods, woolen goods, and shoes.

Claremont and **Newport** utilize the excellent water power of the Sugar River, a tributary of the Connecticut.

Haverhill, the center of a farming region, and with large granite industries, is one of the leading towns on the Connecticut.

Derry is a growing industrial center in Rockingham county. The chief manufactured product is shoes.

Littleton, located on the Lower Ammonoosuc River, has a variety of thriving industrial plants. **Lancaster**, on the Connecticut, a little farther north, is growing in importance as a commercial and industrial center. Both command fine mountain views and are filled each year with summer tourists.

Plymouth, at the "Gateway of the Mountains," is well known as a summer resort, and is the seat of Plymouth Normal School.

Among the other prominent villages in the state are: **Milford**, noted for its granite quarries; **North Conway**, a famous summer resort and the location of granite quarries; **Peterboro**, a busy manufacturing town; **Cornish**, where many men of prominence in the literary and artistic world have summer homes; **Exeter**, the home of Phillips Exeter Academy and Robinson Seminary; **Dublin**, a summer colony and the summer home of the British Embassy.

TABLES

TABLE I. — COUNTIES OF NEW HAMPSHIRE

COUNTY	COUNTY SEAT	VALUE OF FARM PROPERTY	POPULATION 1910	POPULATION 1900
Belknap	Laconia	$ 6,566,137	21,309	19,526
Carroll	Ossipee	7,529,290	16,316	16,895
Cheshire	Keene	10,100,524	30,659	31,321
Coos	Lancaster	7,445,874	30,753	29,468
Grafton	Woodsville	14,148,797	41,652	40,844
Hillsboro	Nashua	14,858,161	126,072	112,640
Merrimack	Concord	13,790,049	53,335	52,430
Rockingham	Exeter	16,559,866	52,188	51,118
Strafford	Dover	5,973,700	38,951	39,337
Sullivan	Newport	6,731,798	19,337	18,009
State		103,704,196	430,572	411,588

TABLE II. — POPULATION OF THE CITIES OF NEW HAMPSHIRE

CITIES	1915[1]	1910
Manchester	76,959	70,063
Nashua	27,114	26,005
Concord	22,480	21,497
Berlin	13,306	11,780
Dover	13,268	13,247
Portsmouth	11,602	11,269
Laconia	11,311	10,183
Keene	10,542	10,068
Rochester	9,078	8,868
Somersworth		6,704
Franklin		6,132

[1] Estimated population, United States Census.

TABLE III. — VALUE OF FARM PRODUCTS, CENSUS OF 1910

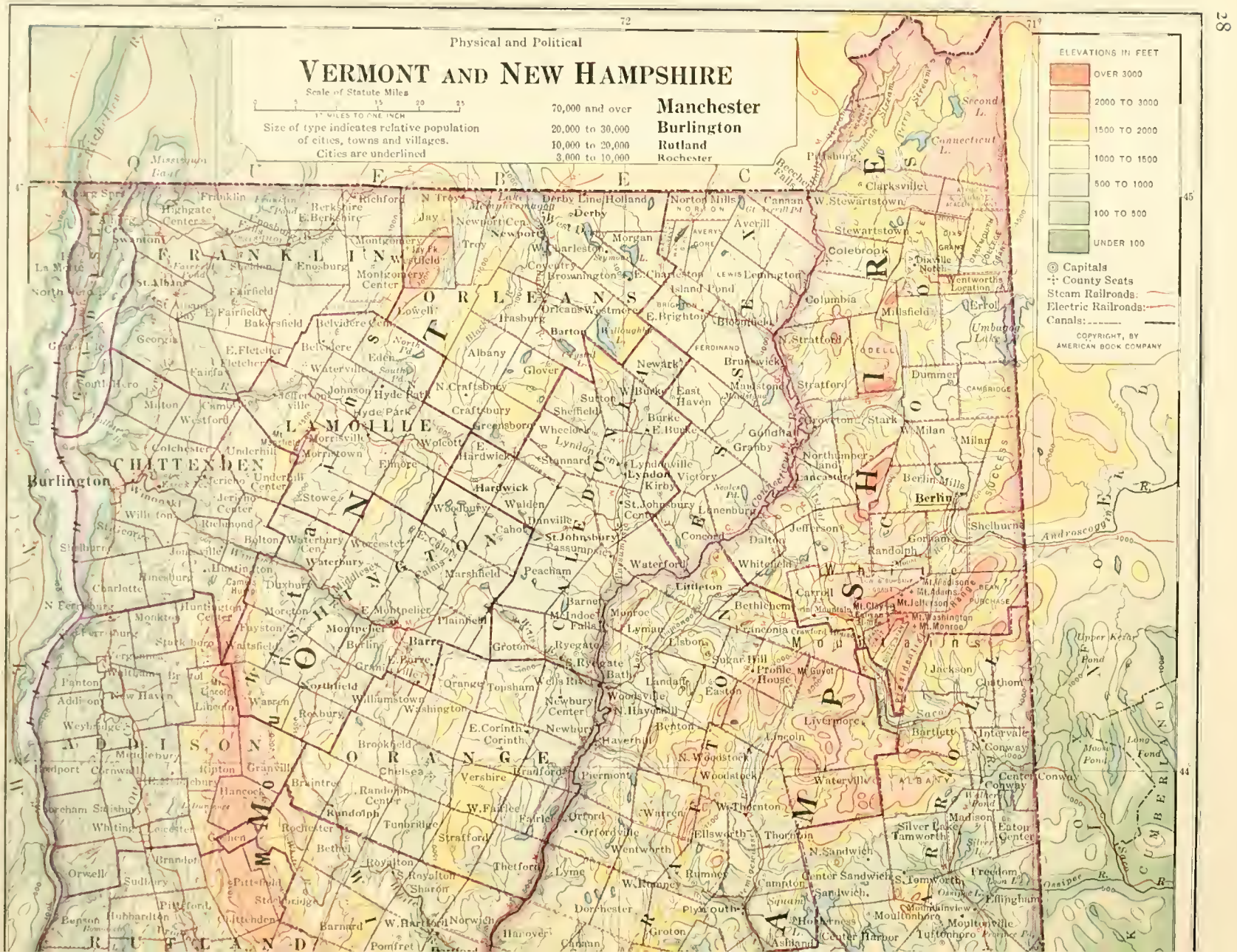
PRODUCTS	VALUE	LEADING COUNTY
Corn	$ 621,306	Merrimack
Oats	216,938	Grafton
Hay and forage	7,846,143	Grafton
Potatoes	1,204,626	Coos
Orchard fruits	719,777	Hillsboro
Maple sugar	63,688	Grafton
Maple sirup	118,653	Grafton
Cattle	5,240,122	Grafton
Horses	5,266,389	Grafton
Swine	504,174	Grafton
Sheep	192,346	Grafton
Poultry	649,121	Hillsboro
Dairy products	5,589,711	Hillsboro
Eggs	2,043,338	Hillsboro
Wool	57,460	Grafton

TABLE IV. — POPULATION OF THE PRINCIPAL TOWNS OF NEW HAMPSHIRE, 1910

Allentown	1,457	Lebanon	5,718
Alton	1,348	Lincoln	1,278
Amherst	1,060	Lisbon	2,460
Andover	1,201	Littleton	4,069
Antrim	1,235	Londonderry	1,533
Ashland	1,412	Lyme	1,007
Barnstead	1,081	Marlboro	1,478
Bartlett	1,197	Meredith	1,638
Bedford	1,110	Merrimack	1,039
Belmont	1,390	Milford	3,939
Bethlehem	1,201	Milton	1,542
Boscawen	1,240	Newmarket	3,348
Bristol	1,478	Newport	3,765
Canaan	1,408	Northfield	1,474
Charlestown	1,496	Northumberland	2,184
Claremont	7,529	Northwood	1,059
Colebrook	1,905	Ossipee	1,354
Conway	3,413	Pembroke	3,062
Cornish	1,005	Peterboro	2,277
Derry	5,123	Pittsfield	2,222
Enfield	1,448	Plaistow	1,173
Epping	1,649	Plymouth	2,200
Exeter	4,897	Raymond	1,203
Farmington	2,621	Rollinsford	1,836
Fitzwilliam	1,148	Rye	1,014
Goffstown	2,579	Salem	2,117
Gorham	2,155	Seabrook	1,425
Greenville	1,374	Stewartstown	1,128
Hampton	1,215	Sunapee	1,071
Hanover	2,075	Swanzey	1,656
Haverhill	3,498	Tilton	1,866
Henniker	1,395	Troy	1,331
Hillsboro	2,168	Wakefield	1,543
Hinsdale	1,673	Walpole	2,668
Hooksett	1,528	Warner	1,226
Hopkinton	1,578	Weare	1,325
Hudson	1,344	Whitefield	1,635
Jaffrey	1,895	Wilton	1,490
Jefferson	1,061	Winchester	2,282
Kingston	1,015	Wolfeboro	2,224
Lancaster	3,054	Woodstock	1,083

TABLE V. — LEADING MANUFACTURES OF NEW HAMPSHIRE, CENSUS OF 1910

PRODUCTS WITH VALUE OF $3,000,000 OR MORE	VALUE OF PRODUCT
Boots and shoes	$39,439,544
Cotton goods	33,601,830
Woolen, worsted, and felt goods and wool hats	16,730,652
Lumber and timber products	15,284,357
Paper and wood pulp	13,994,251
Foundry and machine-shop products	4,946,894
Hosiery and knit goods	4,764,119
Flour-mill and gristmill products	3,187,344


Physical and Political
VERMONT AND NEW HAMPSHIRE
Scale of Statute Miles
0 5 15 20 25
15 MILES TO ONE INCH
Size of type indicates relative population of cities, towns and villages. Cities are underlined
70,000 and over Manchester
20,000 to 30,000 Burlington
10,000 to 20,000 Rutland
3,000 to 10,000 Rochester
ELEVATIONS IN FEET
OVER 3000
2000 TO 3000
1500 TO 2000
1000 TO 1500
500 TO 1000
100 TO 500
UNDER 100
Capitals
County Seats
Steam Railroads:
Electric Railroads:
Canals:
COPYRIGHT, BY AMERICAN BOOK COMPANY
72
71°
45
44
Burlington
CHITTENDEN
LAMOILLE
FRANKLIN
ORLEANS
ESSEX
ADDISON
WASHINGTON
ORANGE
CALEDONIA
WINDSOR
RUTLAND
WINDHAM
GRAFTON
COOS
Connecticut R.
Androscoggin R.
Lake Champlain
Lake Memphremagog
Second L.
Umbagog Lake
Mt. Washington
Mt. Jefferson
Mt. Adams
Mt. Madison
Mt. Clay
Mt. Monroe
Presidential Range
Franconia Mountains
Profile House
Sugar Hill
Crawford House
Fabyan
Jackson
Glen House
Gorham
Berlin
Berlin Mills
Milan
Lancaster
Northumberland
Groveton
Stratford
Colebrook
Pittsburg
Clarksville
Stewartstown
W. Stewartstown
Canaan
Norton Mills
Derby Line
Holland
Newport
Derby
Island Pond
Brighton
Morgan
Averill
Lemington
Columbia
Millsfield
Errol
Wentworths Location
Dixville Notch
Burke
Newark
Sutton
Barton
Orleans
Irasburg
Albany
Glover
Craftsbury
Greensboro
Hardwick
Wolcott
Morrisville
Stowe
Waterbury
Montpelier
Barre
Northfield
Williamstown
Randolph
Bethel
Rochester
Stockbridge
Pittsfield
Chittenden
Rutland
Proctor
Fair Haven
Castleton
Poultney
Middlebury
Vergennes
Bristol
New Haven
Weybridge
Cornwall
Shoreham
Whiting
Orwell
Benson
Hubbardton
Pittsford
Brandon
Sudbury
Leicester
Salisbury
Brattleboro
Putney
Dummerston
Vernon
Guilford
Halifax
Whitingham
Wilmington
Dover
Readsboro
Searsburg
Stamford
Bennington
Shaftsbury
Arlington
Manchester
Sunderland
Pownal
Hoosick
Williamstown
Adams
North Adams
Cheshire
Lanesborough
Dalton
Pittsfield
Lenox
Stockbridge
Great Barrington
Sheffield
Canaan
Salisbury
Kent
Cornwall
Litchfield
Torrington
Winsted
Norfolk
Colebrook
Hartford
Windsor
Springfield
Claremont
Newport
Sunapee
Lake Sunapee
Mount Ascutney
Ascutney
Cornish
Plainfield
Lebanon
Hanover
Norwich
Thetford
Fairlee
Bradford
Newbury
Haverhill
Piermont
Orford
Lyme
Dorchester
Plymouth
Rumney
Ellsworth
Wentworth
Warren
Woodstock
Lincoln
Livermore
Waterville
Thornton
Campton
Sandwich
Center Sandwich
Tamworth
Silver Lake
Madison
Eaton
Conway
Center Conway
Intervale
Bartlett
Saco
Fryeburg
Lovell
Sebago Lake
Harrison
Bridgton
Naples
Casco
Raymond
Windham
Gray
New Gloucester
Poland
Minot
Auburn
Lewiston
Brunswick
Bath
Topsham
Brunswick
Freeport
Yarmouth
Portland
Cape Elizabeth
Scarborough
Saco
Biddeford
Kennebunk
Kennebunkport
Wells
Ogunquit
York
Kittery
Portsmouth
Rye
Hampton
Exeter
Newmarket
Durham
Dover
Somersworth
Rochester
Farmington
Wolfeboro
Alton
Gilmanton
Pittsfield
Chichester
Epsom
Northwood
Deerfield
Nottingham
Barrington
Strafford
Lee
Madbury
Newington
Rollinsford
Berwick
South Berwick
Eliot
Kittery
Kittery Point
Isles of Shoals
Appledore
Star
Smuttynose
Duck
Lake Winnipesaukee
Lake Winnisquam
Lake Sunapee
Lake Ossipee
Squam Lake
Newfound Lake
Lake Asquam
Lake Waukewan
Lake Winnipesaukee
Lake Memphremagog
Connecticut Lake
Second Lake
Umbagog Lake
Androscoggin River
Connecticut River
Merrimack River
Saco River
Ossipee River
Pemigewasset River
Winnipesaukee River
Contoocook River
Ashuelot River
Black River
Otter Creek
Lamoille River
Missisquoi River
Passumpsic River
Ammonoosuc River
Upper Kezar Pond
Long Pond
Mooki Pond
Silver Lake
Tamworth
Ossipee Lake
Squam Lake
Newfound Lake
Lake Asquam
Lake Waukewan
Lake Winnipesaukee
Lake Memphremagog
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Upper Kezar Pond
Long Pond
Mooki Pond
Silver Lake
Tamworth
Ossipee Lake

Concord
Manchester
Nashua
Portsmouth
Dover
Laconia
Keene
Berlin
Rutland
Bennington
Brattleboro
Burlington
Montpelier
Barre
Middlebury
Woodstock
Windsor
Springfield
Claremont
Newport
Lebanon
Hanover
Littleton
Franklin
Plymouth
Rochester
Somersworth
Exeter
Hampton
Newburyport
Greenland
Rye
Seabrook
Hampton Falls
Salisbury
Andover
Warner
Bradford
Henniker
Hillsborough
Peterborough
Jaffrey
Winchester
Fitzwilliam
Richmond
Gilsum
Marlow
Stoddard
Sullivan
Nelson
Antrim
Deering
Weare
Goffstown
Bedford
Merrimack
Amherst
Milford
Mason
Hollis
Brookline
Pelham
Windham
Salem
Hudson
Londonderry
Derry
Litchfield
Hampstead
Atkinson
Plaistow
Kingston
Newton
Sandown
Danville
Fremont
Epping
Raymond
Auburn
Candia
Deerfield
Nottingham
Barrington
Northwood
Epsom
Pembroke
Allenstown
Chichester
Loudon
Canterbury
Northfield
Tilton
Belmont
Gilmanton
Alton
Wolfeboro
Ossipee
Effingham
Freedom
Madison
Eaton
Conway
Jackson
Bartlett
Intervale
North Conway
Glen
Gorham
Milan
Dummer
Stratford
Lancaster
Whitefield
Littleton
Bethlehem
Franconia
Sugar Hill
Lisbon
Landaff
Haverhill
Piermont
Orford
Lyme
Hanover
Enfield
Grafton
Canaan
Orange
Groton
Wentworth
Rumney
Ashland
Holderness
Sandwich
Tamworth
Moultonborough
Wolfeboro
Alton
Gilmanton
Barnstead
Center Barnstead
Pittsfield
Chichester
Epsom
Northwood
Nottingham
Lee
Durham
Newington
Dover
Somersworth
Rochester
Farmington
Milton
Union
Brookfield
Wakefield
Sanbornville
Wolfeboro Falls
Center Harbor
Meredith
Bristol
Hill
Andover
Danbury
Grafton
Enfield
Lebanon
Hanover
Plainfield
Cornish
Croydon
Newport
Claremont
Unity
Charlestown
Walpole
Westmoreland
Chesterfield
Hinsdale
Winchester
Swanzey
Troy
Fitzwilliam
Richmond
Rindge
Jaffrey
Peterborough
Dublin
Harrisville
Marlboro
Keene
Surry
Gilsum
Alstead
Langdon
Acworth
Washington
Lempster
Goshen
Sunapee
New London
Wilmot
Springfield
Grantham
Cornish Flat
Windsor
Cornish
Plainfield
Meriden
Hartland
Reading
Weathersfield
Springfield
Chester
Londonderry
Windham
Derry
Salem
Hudson
Nashua
Milford
Amherst
Merrimack
Bedford
Goffstown
Weare
Deering
Hillsborough
Antrim
Bennington
Dublin
Harrisville
Marlboro
Keene
Surry
Sullivan
Nelson

GEOGRAPHY OF VERMONT

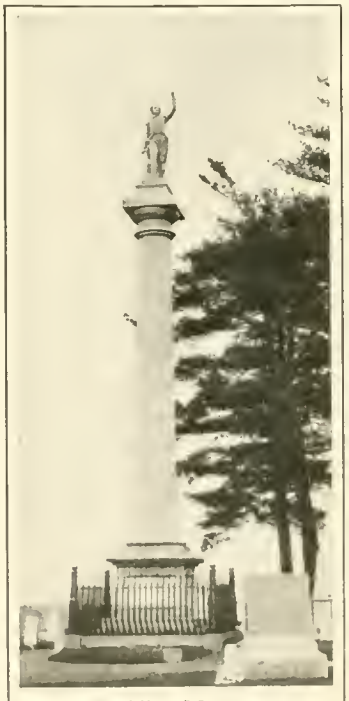
By Albert W. Varney
Superintendent of Schools, Bennington, Vermont

HISTORY

Many years before the settlement of New England and Canada by white men, the section of country now known as Vermont was a highway of Indian warfare. The long lake on its western border and the great river on the east were natural highways for the birch canoe in summer and for the snowshoe in winter. By means of several passes over the Green Mountains, which lie between these natural highways, the Indian bands passed to and fro between lake and river in their tribal wars.

Later, when English and French were pushing out their settlements farther and farther into the wilderness, this land though fertile and well watered remained unoccupied save for the passage of marauding bands of French and Indians in their stealthy attacks on the English settlements of New England. From the St. Lawrence the Indian canoe could pass up the Richelieu River into Lake Champlain. From thence the journey to the Connecticut was made by several well-known routes. One, up the Winooski River and down the White, was so much used that the English settlers called the former stream the "French River." Another was up Otter Creek and down the Black or West rivers. It was commonly known in early times as the "Indian Road." Another route, used by Canadian expeditions from the St. Lawrence, was up the St. Francis to Lake Memphremagog, across the short divide and down the Passumpsic to the Connecticut.

In 1609 Champlain, a French explorer, discovered the lake which now bears his name. The French by right of his discovery claimed all this region. The first settlement attempted in Vermont was by the French in 1665 on Isle la Motte, when a fort called St. Anne was built. Fort Dummer, built by the English in 1724 in the extreme southeastern corner of the state, was the first permanent settlement. The settlement of Bennington in 1761 was the first permanent English settlement made for the establishment of homes.



Ethan Allen Monument, Burlington

New York, New Hampshire, and Massachusetts each claimed this territory. The early settlers received title to their farms from Governor Benning Wentworth of New Hampshire, in the form of township grants; from which fact the state was called for many years the "New Hampshire Grants." The governor of New York also deeded these same lands to other settlers. The trouble arising from these double titles developed into a general controversy which brought about the organization of the "Green Mountain Boys," who, under Ethan Allen, drove out the New Yorkers, and later gave valuable aid in the Revolutionary War. Claimed by three colonies, Vermont denied the authority of all, and in 1777 declared its independence and established a complete government, and in 1791 was admitted to the Union.

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The Green Mountains above White River Junction

POSITION AND SIZE

Vermont, the most northwestern of the New England states, ranks next to Maine in area. It is about one fifth the size of New York, and is nearly eight times the size of Rhode Island. Vermont, New Hampshire, and Massachusetts are very nearly the same size (Sec. 77). Its length north and south is about 160 miles, its northern boundary about 60, and its southern 40 miles. Its northern boundary is nearly a straight east-and-west line which at Lake Memphremagog is 45 degrees north latitude. Its most southern point, the southeast corner, is 42° 44′ north latitude. It takes fast trains between four and five hours to pass through the state in a north and south direction.

RELIEF AND DRAINAGE

Relief.—The state lies in the northern part of the great Appalachian highland (Sec. 14). The only portion free from mountains and high hills is the Champlain Valley. The greater part of Vermont is covered by the various ridges of the Green Mountains, which extend north and south across the state. From the French name of these mountains, Verd Mont, the state derived its name. The general altitude of the mountainous section is 2000 feet, with peaks rising here and there to about 4000 feet. Stratton, near the south line of the state, is 3839 feet; Equinox is 3872; Killington, near Rutland, is 4221; Lincoln is 4078; Camel's Hump is 4088; Mansfield, the highest peak, is 4389; and Jay, at the extreme north, is 4018.

The Champlain Valley is about 120 miles long and from 15 to 25 miles wide; the surface is uneven, but there are few high hills. It affords the state's broadest and best meadows. The lake shore south of Burlington is firm, in many places rocky, but farther north it becomes low and in some parts marshy. The flood plains (Sec. 18) of the rivers in this valley are extensive and fertile.

Evidence of glacial action may be seen in the numerous drumlins and moraines scattered over the state.

Vermont scenery is unsurpassed in beauty and variety. The green hills and mountains separated by the open, fertile valleys, each with its brook or river, and dotted with lakes and ponds fed by the mountain springs, are calling from the cities an increasing number of summer visitors.

Lake Memphremagog from Owl's Head

Drainage.—Vermont lies in four distinct drainage systems,—Connecticut River, Lake Champlain, Hudson River, and Lake Memphremagog. The latter two drainage areas are of small extent. Bennington County is drained by the Hoosic and the Batten Kill rivers, which flow into the Hudson. A portion of Orleans County, in the extreme north-central part of the state, is drained by rivers flowing into Lake Memphremagog. The five counties along the eastern border are drained by the tributaries of the Connecticut. The remaining seven counties are in the Champlain basin. The chief rivers of Vermont that flow into Lake Champlain are the Missisquoi, Lamoille, Winooski, and Otter. The Missisquoi, rising in Vermont, flows into Canada, around the northern extremity of the Green Mountains, then back into the state. The Lamoille and the Winooski rivers rise in the north-central part, and, breaking through the main range of mountains, flow into Lake Champlain. The Otter, with its headwaters in Bennington County, flows north through Rutland and Addison counties.

The main watershed of the state, beginning at the Massachusetts line, follows the main range of the Green Mountains northward to the southwest corner of Washington County, thence in a winding northeasterly direction to a point on the Canadian line a few miles west of the Connecticut River.

Ages ago, during the Glacial Period (Sec. 32), this state was covered with ice. The great ice mass ground down the hilltops and

Lake Champlain from Burlington, with the Adirondack Mountains in the distance

The Connecticut River at Bellows Falls

filled the valleys with glacial drift. It scooped out hollows which are now lakes or ponds. In some places moraines were deposited across river valleys, and by damming the streams converted the upper part of the valleys into lake basins.

The state has more than 300 lakes and ponds, the greater portion in the northeastern part. The five largest lakes, named in the order of size, are: Bomoseen, Willoughby, Seymour, Dunmore, and St. Catherine.

The rivers of Vermont have a steep fall, and they are therefore capable of furnishing a large amount of water power (Sec. 17). In the basin of the Winooski alone there are 80 sites at which water power has been developed. Most of these plants are small, developing from 40 to 200 horse power; five are over 1000, and that at Bolton Falls develops 3000. The aggregate power in and near Winooski is about 5000 horse power, and at Essex Junction 10,000. Otter Creek furnishes several good power plants, the largest being at Sutherland Falls in Proctor. In Somerset, a mountain village in Windham County, there has been constructed the largest dam in New England, 2080 feet long and 106 feet high. The storage reservoir created is about 2000 acres in extent. The largest power plant in the state is located at Vernon on the Connecticut, where a great dam sets the water back for twenty-two miles and develops 27,000 horse power. There is much undeveloped power on the upper Connecticut River.

CLIMATE

Vermont has cool summers and long cold winters with heavy snowfall. Because of their elevation, the Green Mountains have cooler summers and colder winters than the other sections of the state.

The climate of the western part of the state is modified by Lake Champlain, which is the largest body of fresh water in the United States except the portions of the Great Lakes which lie within her borders. Over the section bordering on the lake the air currents

Water-power plant, Essex Junction

A lumber camp in Vermont

are warmer, often resulting in no precipitation or in rain when on the mountains to the east the snowfall is heavy.

The average rainfall of the state is nearly 40 inches. In the southern part it is about 35 inches, and in the mountains of the north-central section it is nearly 50 inches. More rain falls in summer than in any other season. Snow comes in November and usually remains until April.

FORESTS, GAME, AND FISH

Originally the state was one unbroken forest. The early settlers cleared the land in the valleys and on the lower hills; and some, going back into the higher mountains, cleared lands which, removed from main lines of transportation and markets, were unprofitable. Many of these mountain farms have been allowed to revert to woodland. There are large areas of valuable timber trees, and lumbering ranks as one of the leading industries. The value of the annual lumber and timber products of Vermont amounts to over $10,000,000.

The state has recently established a department of forestry for the better control of the forests of the state. Scientific reforestation has been begun in some sections, the state nurseries furnishing thousands of pine and spruce seedlings.

The numerous small water powers widely distributed are especially adapted to working up the wood products near the source of supply.

The shipping box industry uses over 40 million feet of lumber, mostly hemlock and low-grade pine and spruce. The hardwoods are used in the manufacture of furniture and novelties of all sorts.

Many farms in Vermont have maple groves which are equipped with modern tanks, boilers, and evaporators for making maple sugar.

The streams are well stocked with fish, and the woods abound in wild game protected by fish and game laws designed to foster true sportmanship. From 2500 to 3000 deer are killed during the open season each year. Occasionally moose are seen and black bears are not uncommon. Foxes and wildcats are still hunted, and squirrels, rabbits, and woodchucks or ground hogs are numerous. The partridge is the common game bird of the woods.

AGRICULTURE

Soil.—The hills of limestone and granite eroded by the great glaciers produced a fertile soil. The soils of Vermont vary in texture from stony loams to heavy clay.

Many sections have a clay loam with a clay subsoil. In the Champlain Valley, especially along the Otter, there is much heavy clay. Most of the hillsides are a light loam. The clays are excellent grass lands, and the lighter soils produce potatoes, corn, and garden truck.

The leading crops of Vermont are hay and other forage, potatoes, oats, and corn. The value of the grain crops is but one sixth of that of hay and other forage crops. Apples are the most important orchard fruit. The western part of the state is peculiarly well adapted both in soil and climate to apple growing. There are several large commercial orchards in Grand Isle and Chittenden counties.

A good hay crop, Whitingham

Because of the high price of grain the state cannot successfully compete with the West in the raising of beef cattle, and hardly furnishes its own supply of hog products.

Horses and sheep are raised in numbers nearly sufficient for local demand. The Morgan horse has long been a favorite, though recently the Percheron is receiving more attention as an excellent work horse. The United States Department of Agriculture maintains a farm in the town of Weybridge for the breeding of Morgan horses.

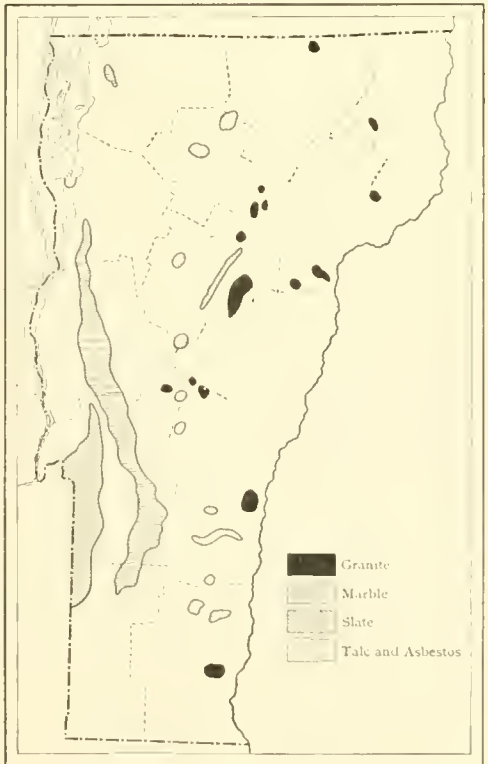
Addison County has a reputation for fine Merino sheep. Many of them are shipped to other parts of the country for breeding purposes.

Poultry keeping is general, both on the farms and in the villages. Bee keeping is profitable.

Vermont is primarily a dairying state. The southern part ships nearly all its surplus milk to New York and Boston, and does not make sufficient butter to supply the local demand, but the northern section produces large quantities. Vermont produces more pounds of butter per capita than any other state, and also leads in the number of pounds of butter per cow. One third of all the cattle of New England are in this state. Vermont produces annually over thirty-five million pounds of butter, three million pounds of cheese, thirteen million pounds condensed milk, and ships out of the state over fifty million quarts of milk and three million quarts of cream. The state, with an area of less than 10,000 square miles, is surpassed by only fourteen states in the total value of dairy products.

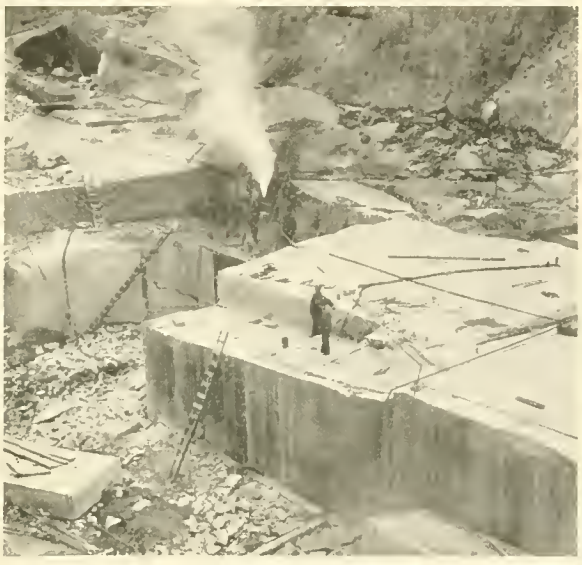
MINERAL WEALTH

The state is rich in mineral wealth. It has long been in the lead of all other states in the production of marble. The deposits of this stone extend from Isle la Motte to Manchester. Marbles of the finest texture rivaling those of Italy and Greece are quarried. Proctor is the center of the industry, and is the home of the largest marble-producing plant in the world. It has twenty-five acres of floor space in its mills, and employs 4000 men. The blocks of marble are sawed by sand fed under the edges of iron bands. Some idea of the extent of this industry may be gained from the fact that during the last ten years one and one half million tons of sand have been used in this work. The state produces annually over 1,000,000 cubic feet of marble (Sec. 94; Figs. 106, 107).



Mineral resources of Vermont

Granite is widely distributed, and Vermont



Granite quarry, Barre

Marble-cutting plant, Proctor

stands first also in production of this stone. The growth of the granite business during the last twenty years has been rapid. It has more than doubled in the last decade. There are nearly 150 companies engaged in the industry and the state produces twelve to fifteen per cent of all granite quarried in the United States. Barre is the center of granite for monuments, and Hardwick of building granite. Both Barre and Hardwick granite are gray in several shades. The white granite of Bethel is the whitest known granite and is of excellent quality.

There are extensive slate belts. The only one that has been extensively developed is situated on the western edge of the state, beginning in Bennington County and extending into Addison County. The principal quarries, numbering about 100, are in Rutland County. Vermont ranks next to Pennsylvania in the production of slate.

The largest known deposit of asbestos is in Canada. This vein extends into Vermont and forms the largest known deposit in this country. The long-fiber variety known as chrysotile asbestos may be spun and woven into cloth.

The talc and soapstone deposits are extensive. Talc is mined in several localities, but the upper part of the White River Valley yields the largest amount. The state ranks next to New York in the production of talc, and next to Virginia in soapstone.

Limestone quarries scattered over the state produce stone for building, for burning into lime, and for crushing into road material. Clays are used in many places in the manufacture of brick. Kaolin, dug at Bennington, Shaftsbury, Rutland, Brandon, Monkton, and elsewhere, is shipped largely for sizing of paper in the large mills of Massachusetts.

MANUFACTURING

Vermont is not an important manufacturing state, but the increasing development of her water power, aided by electric transmission, is constantly increasing the number engaged in industrial work, which is now about eleven per cent of the total population. The large amount of water power, nearness to market, excellent transportation facilities by rail and water, make possible a great industrial future.

Interior of scale works, St. Johnsbury

The three most important manufacturing industries of Vermont are marble and stone work, the sawing of lumber and making of other wood products, and the manufacture of dairy products. Other important manufactured products of the state are woolen goods, flour, wood pulp and paper, weighing scales, and machinery. Burlington is the chief manufacturing city of the state.

Sawmills and woodworking establishments are widely distributed throughout the state. At St. Johnsbury is the largest plant in the world for the manufacture of weighing scales; another plant is at Rutland; and one has recently been established at Bennington. Many of the piano sounding boards used in this country are made at North Troy and Orleans. Steel squares have been made at South Shaftsbury for a hundred years. Springfield manufactures the famous turret lathes which are used in making shoe lasts.

ROUTES OF TRADE

The railroads of the state are parts of three great systems. The Rutland, a part of the New York Central system, entering the state at Alburg, crosses the large islands of Lake Champlain and follows up the Otter to near its headwaters, then extends across Bennington county, and connects at Troy, New York, with other lines of the New York Central. Its main branch leaves the Otter at Rutland, crosses the mountains, and follows down the Black and Williams rivers to Bellows Falls. At this city it connects with the Boston and Maine, which gives through service to Boston. The Central Vermont, a part of the Grand Trunk system, entering the state at Highgate, runs south to the Winooski, thence up that stream, and down the White River valley, to the Connecticut River. It then follows that river to the state line, using the Boston and Maine tracks from Windsor to Brattleboro, and extends southeastward to New London on Long Island Sound. A line of the Grand Trunk which connects Montreal and Portland passes through the northeastern corner of Vermont. The railroads of the Boston and Maine system connect many points in the Connecticut Valley with other parts of New England. One railroad of this system extends northward from White River Junction through St. Johnsbury, along the east shore of Lake Memphremagog to Sherbrooke, Canada. At Newport this railroad connects with a line of the Canadian Pacific running into Montreal. The St. Johnsbury and Lake Champlain, which is a railroad of the Boston

Paper mills, Bellows Falls

and Maine system, extends from St. Johnsbury to Maquam on Lake Champlain. There are other short lines which, with the main lines, give Vermont excellent transportation service.

Lake Champlain has long been connected by canal with the Hudson River, giving the western part of the state an uninterrupted waterway to New York.

GOVERNMENT AND EDUCATION

Government.—The legislative department consists of a Senate and a House of Representatives. The Senate consists of thirty members, apportioned to the several counties according to population. The House of Representatives consists of 246 members, one from each town and city. The chief officers of the executive department are governor, lieutenant governor, treasurer, secretary of state, auditor, and attorney general. These officers and members of the legislature are elected by the people biennially on the first Tuesday after the first Monday of November of the even-numbered years. The courts of Vermont consist of the Supreme Court, County Courts, Court of Claims, and Probate, Juvenile, Justice, and Municipal Courts. The judges of the county courts are called superior judges.

Capitol, Montpelier

Like all New England states, the town is the unit of government. The town meeting, in March, is the people's legislature. The independence and power of the town is zealously guarded.

Education. The educational policy of the state is largely determined by a state board of education and a commissioner of education. The board of education consists of five members appointed by the governor. The commissioner of education is appointed by the board of education. The common schools are under professional supervision by the district system. The superintendents are state officers appointed by the state board.

High schools of different classes are maintained. Teacher training courses are conducted in the larger high schools for the preparation of teachers for rural schools. The state has four colleges: the University of Vermont, at Burlington; Middlebury College, at Middlebury; Norwich University, at Northfield; and St. Michael's College, at Winooski. There are two normal schools,—one at Castleton, the other at Johnson.

The Vermont Industrial School, at Vergennes, is a semipenal institution for boys and girls committed by the juvenile courts.

The state maintains two agricultural schools,—the Theodore N. Vail Agricultural School and Farms at Lyndon, and the State School of Agriculture at Randolph.

There are still a number of academies more or less endowed which do excellent work as preparatory schools. The most important are St. Johnsbury Academy; Vermont Academy, at Saxtons River; Lyndon Institute, at Lyndon Center; Derby Academy; Montpelier Seminary; Goddard Seminary, at Barre; Troy Conference Academy, at Poultney; Brigham Academy, at Bakersfield; Bellows Free Academy, Fairfax; and Burr and Burton Seminary, at Manchester. There are excellent parochial academies at Burlington, Rutland, St. Johnsbury, and St. Albans.

CITIES

Of the total population of Vermont, 47.5 per cent in 1910 lived in cities and villages of 2500 or more inhabitants. The rural population in that year was 52.5 per cent of the total.

Burlington is the largest city of Vermont. It is situated on the shore of Lake Champlain, and is an important trade center. Water connection with the Hudson River by the Champlain Canal gives cheap coal for fuel, while large water power developed on the Winooski gives it an advantage in manufacturing. Water connection with the St. Lawrence and the Canadian lumber districts makes it an important lumber market. Its chief manufactures are packing boxes, sash, doors, blinds, dyes, butter color, patent medicines, cotton goods, brush fibers, cereal foods, refrigerators, and confectionery.

The Ethan Allen monument, park, and tower are among the points of interest in Burlington.

Rutland owes its growth to the marble industry, the junction of three railroads, the railroad shops, and the manufacture of scales and balances. Other manufactures are utensils for making maple sugar, fire clay, gypsum, asbestos products, stone-working machinery, silos, and creamery and dairy apparatus.

Barre, located on a branch of the Winooski, is the center of the monumental granite business of the whole country. It has small local water power, but by electric transmission it uses the power developed on the Winooski at Essex Junction. Its growth is due to the extensive granite deposits near the city. The manufacture of stone-working tools has developed along with the quarrying. A statue of Robert Burns erected in a public square is a rare piece of granite sculpture.

Montpelier, the capital of the state, is situated near the headwaters of the Winooski. The granite business is the most important industry. It also manufactures sawmill machinery, saddlery supplies, and clothespins. It is the home of several insurance companies. Some of the points of interest are the fine granite State House, the new city hall, and the Wood Art Gallery.

St. Johnsbury, situated at the junction of the Passumpsic and the Moose rivers, manufactures scales, brass valves, belting, mill supplies, files, forks, and hoes. It is a center of trade in maple-sugar products.

Brattleboro, on the Connecticut, has an abundance of electric power furnished by the great Vernon dam. Organs and pianos are manufactured here. There are also extensive cotton mills, a large chair shop, and an overalls factory. Fort Dummer monument and Island Park are points of interest.

St. Albans, in the northwestern part of the state, near the lake shore, is a division point of the Central Vermont Railway. The railroad shops and offices form the most important industry of the city. Khaki uniforms and other clothing are manufactured on a large scale. The large creamery formerly famed for the quality and the quantity of its butter is now shipping milk and cream in refrigerator cars to Boston.

Bennington, situated on a branch of the Hoosic, has made excellent use of its water power. Its most important manufactured products are knit underwear, knitting machines, woolen dress goods, scales, and pulp mill machinery. Points of interest are Bennington Battle Monument and the State Soldiers' Home.

Bellows Falls, on the Connecticut, where the river falls over 40 feet, is known as the "Paper Town," because of its fourteen paper mills. In 1802 the first paper mill in Vermont was built here, and it is claimed that here in 1869 was made successfully the first paper from wood pulp. The canal around these falls was built for purposes of navigation and was probably the first canal in this country. It was chartered in 1791. Other important manufactures are waxed paper, cream separators, scythe snaths, and pulp plaster.

Springfield, on the Black River, is best known for its manufacture of turret lathes and gear-cutting machines. An important industry is the manufacture of wool substitutes and shoddies. A large shoddy mill at this place has a capacity of ten million pounds a year.

Winooski is an important industrial village, manufacturing window and door screens and woolen goods. **Swanton** has a large ammunition factory. **Ludlow** makes large quantities of woolen cloth. **Newport** manufactures lumber and veneer on a large scale. **Readsboro** manufactures chairs, school desks, and furniture. **Vergennes**, the first chartered city in the state, manufactures shade rollers, spark plugs, and the wooden parts of

weighing scales. **Wallingford** is known for the manufacture of forks, hoes, rakes, and other tools. **Windsor's** chief industry is the making of automatic screw machines and automatic drills.

TABLES

Table I.—Population of the Chartered Cities of Vermont, 1915, 1910

	1915	1910
Burlington	21,432	20,468
Rutland	14,624	13,546
Barre	11,937	10,734
Montpelier	——	7,856
St. Albans	——	6,381
Vergennes	——	1,483

Table II.—Population of Towns of Vermont having 2500 Inhabitants or More, 1910

Bennington	8,698	Waterbury	3,273
St. Johnsbury	8,098	Northfield	3,226
Brattleboro	7,541	Lyndon	3,204
Colchester	6,450	Hardwick	3,201
Rockingham	6,207	Randolph	3,191
Springfield	4,784	Fair Haven	3,095
Barre	4,194	Richford	2,907
Hartford	4,179	Proctor	2,871
Newport	3,684	Middlebury	2,848
Poultney	3,644	Essex	2,714
Derby	3,639	Brandon	2,712
Swanton	3,628	Morristown	2,652
West Rutland	3,427	Woodstock	2,545
Barton	3,346		

Table III.—Incorporated Villages having More Than 500 Inhabitants in 1910

St. Johnsbury	6,693	Woodstock	1,383
Brattleboro	6,517	Waterbury	1,377
Bennington	6,211	Barton	1,330
Bellows Falls	4,883	Essex Junction	1,245
Winooski	4,520	Swanton	1,236
Springfield	3,250	Bristol	1,180
Proctor	2,756	Enosburg Falls	1,153
Fair Haven	2,554	Orleans	1,131
Newport	2,548	West Derby	1,109
Hardwick	2,094	Readsboro	835
Richford	1,948	Richmond	828
Northfield	1,918	North Troy	771
Windsor	1,906	Chester	666
Middlebury	1,866	North Bennington	663
Randolph	1,787	Johnson	651
Ludlow	1,621	Milton	634
Brandon	1,608	Bradford	631
Island Pond	1,573	Wells River	608
Lyndonville	1,573	Cambridge	595
Morrisville	1,445	Stowe	566
Poultney	1,474		

Table IV.—Area and Population of the Counties of Vermont

Name	Area	Population, 1910
Addison	719	20,010
Bennington	612	21,378
Caledonia	640	26,031
Chittenden	485	42,447
Essex	620	7,384
Franklin	549	29,866
Grand Isle	77	3,761
Lamoille	431	12,585
Orange	650	18,703
Orleans	689	23,337
Rutland	862	48,139
Washington	571	41,702
Windham	782	29,932
Windsor	893	33,681

Table V.—Leading Manufacturing Industries of Vermont, Census of 1910

All industries	68,310,000
Marble and stone work	12,395,000
Lumber and timber products	8,598,000
Butter, cheese, and condensed milk	8,112,000
Woolen goods	4,497,000
Flour-mill and gristmill products	4,133,000
Paper and wood pulp	3,902,000
Foundry and machine-shop products	3,755,000
Hosiery and knit goods	1,746,000
Furniture and refrigerators	1,618,000
Patent medicines and drugs	1,290,000
Clothing, men's	1,274,000
Railroad cars and repairs	1,135,000
Printing and publishing	1,039,000

Table VI.—Value of Leading Farm Products, Census of 1910

Hay and forage	$16,336,000
Potatoes	1,743,000
Oats	1,169,000
Corn	1,102,000
Barley	226,000
Buckwheat	122,000
Beans	73,000
Tobacco	17,000
Wheat	14,000
Cattle	11,829,000
Horses	8,591,000
Swine	975,000
Poultry	608,000
Sheep	539,000
Milk and other dairy products	12,128,000
Eggs	1,715,000
Wool	192,000

GEOGRAPHY OF MASSACHUSETTS

By Charles P. Sinnott
Professor of Geography, State Normal School, Bridgewater, Massachusetts

EARLY SETTLEMENT

The first permanent settlement on the New England coast was made at Plymouth in 1620 by the Pilgrims. These colonists had come to the new continent to seek the freedom of worship which had been denied them in their English home. They had intended to settle much farther to the south, but storms drove them from their course, and they were finally glad to land at Plymouth. They were unprepared for the severity of the winter, as Plymouth is much farther south than England. The winter winds in England, which blow from the ocean, are tempered by the warm waters of the Atlantic. At Plymouth the winter winds blow from over the cold lands to the west and north, making the climate relatively severe. The suffering during the early years was intense, but nothing could turn these hardy settlers from their purpose. In spite of all hardships, therefore, the colony prospered and new towns were settled.

"The Puritan," Springfield.
A bronze statue by St. Gaudens

About ten years after the landing of the Pilgrims the Puritans began to settle the shores of Massachusetts Bay north of Plymouth, at Salem and in the neighborhood of Boston. The Puritans also had left England to worship in their own way. Their colony was larger, wealthier, and better equipped for pioneer life than the one at Plymouth. And more important than its wealth, the Bay Colony possessed an excellent harbor at Boston, while the one at Plymouth proved much too shallow for shipping. Again, the country about Boston proved to be a fertile section, while that about Plymouth was found to be almost worthless for farming. Therefore Boston and the surrounding towns grew more rapidly. The two colonies were united in 1692 under the name of Massachusetts.

Settlements gradually spread from these two points to other parts of Massachusetts and New England. The Connecticut Valley in both Massachusetts and Connecticut proved very inviting, and early settlements were made on its fine farming lands.

From these simple beginnings Massachusetts has grown into one of the most populous sections of the world.

Questions and Exercises.

1. Who were the Pilgrims? The Puritans?
2. What advantages did the Bay Colony have that the Plymouth Colony did not possess?
3. Make a list of Massachusetts men who are famous in history.
4. Make a collection of pictures of historic places in Massachusetts.
5. Read all you can about the history of your home locality. Learn all you can about the origin of the names of places in your county.

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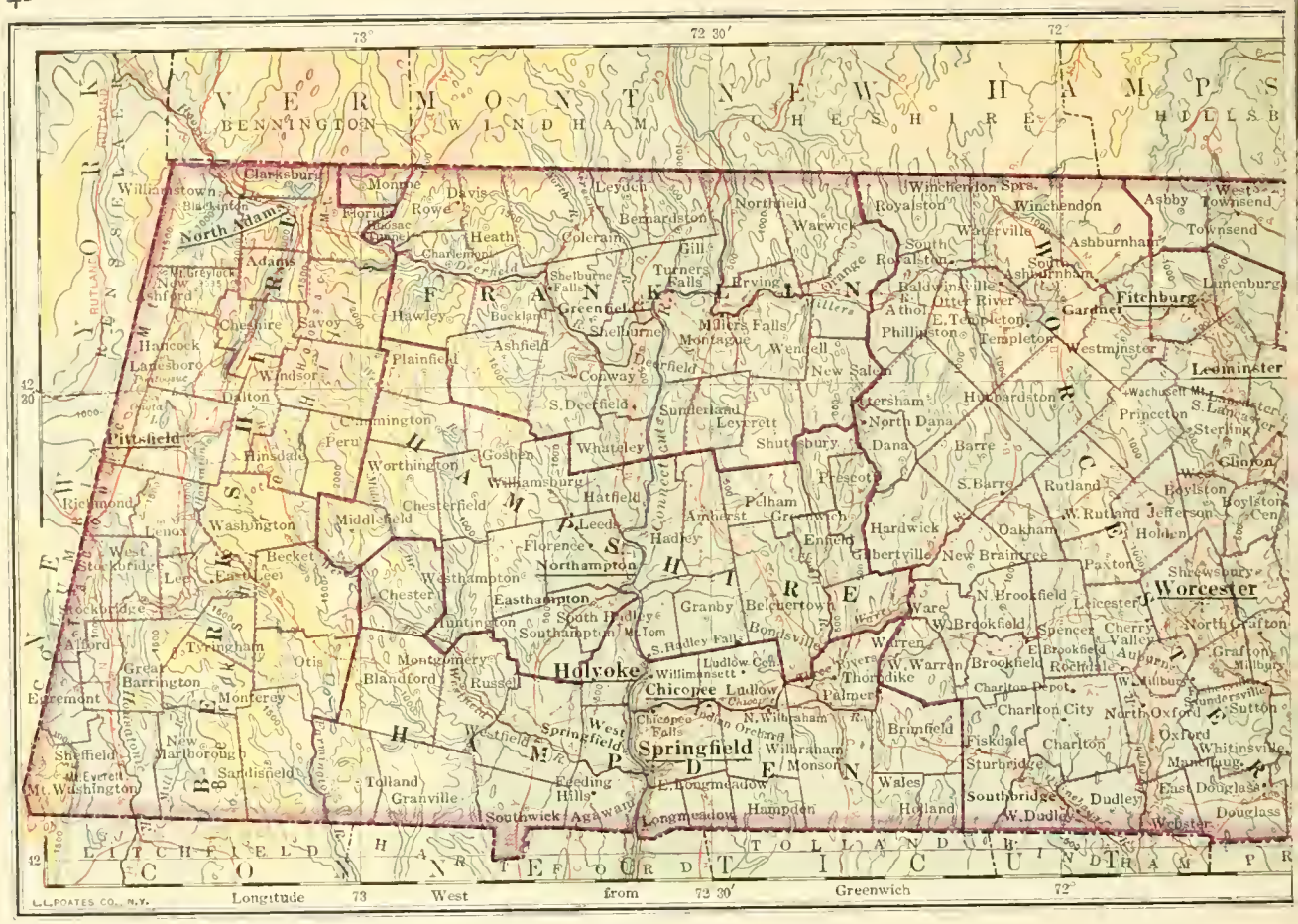


Map Study.—1. What states border Massachusetts?

2. What is the capital of the state?

3. Locate Cape Ann and Cape Cod. 4. Where is Cape Cod Bay? Massachusetts Bay? Buzzard's Bay? Boston Bay? 5. Where is Monomoy Point? 6. Locate the Elizabeth Islands. 7. Where are Plum Island and Nahant? 8. Locate Vineyard Sound and Nantucket Sound.

9. Locate Plymouth, Provincetown, Woods Hole, Salem, Gloucester, Marblehead.

10. Where are Mt. Greylock and Mt. Wachusett? Where are the Berkshire Hills? Taconic Mountains? Hoosac Mountains? 12. Locate Mt. Tom, Mt. Holyoke, and Mt. Everett. 13. Where is the Hoosac Tunnel?

14. What river crosses the state from north to south? 15. Trace the course of the Merrimack. 16. Name and trace the important branches of the Connecticut. 17. Locate and trace the Housatonic and Hoosic rivers. 18. Trace the course of the following rivers: Taunton, Charles, Concord. 19. What river is partly in Massachusetts and partly in Rhode Island?

20. Locate Lowell, Fall River, Springfield, Worcester, North Adams, Fitchburg, Pittsfield, Holyoke, Haverhill, New Bedford.

21. What parts of Massachusetts have an elevation of less than 100 feet above sea level? What parts are from 100 to 500 feet in elevation? 500 to 1000 feet? 1000 to 2000 feet? 2000 to 3000 feet? What parts are more than 3000 feet in elevation?

22. On the map find each of the counties of Massachusetts. Which county occupies the western end of the state? Which are on the coast?

POSITION AND SIZE

Massachusetts occupies a central position in the New England states. Maine, New Hampshire, and Vermont lie to the north, and Connecticut and Rhode Island to the south.

Physical and Political
MASSACHUSETTS
Scale of Statute Miles
0 5 10 15 20
14 MILES TO ONE INCH
Capital
County Seats
Post office of town name
Cities are underlined
Size of type indicates relative population of places
700,000 and over Boston
50,000 to 150,000 Worcester
20,000 to 50,000 Waltham
10,000 to 20,000 Winthrop
County Seats with less than 10,000 population Nantucket
Steam Railroads:
Electric Railroads
Canals:
ELEVATIONS IN FEET
OVER 3000
2000 TO 3000
1500 TO 2000
1000 TO 1500
500 TO 1000
100 TO 500
SEA LEVEL TO 100
COPYRIGHT, BY AMERICAN BOOK COMPANY
MASSACHUSETTS BAY
CAPE COD BAY
ATLANTIC OCEAN
NANTUCKET SOUND
VINEYARD SOUND
BUZZARDS BAY
Boston
Lawrence
Lowell
Haverhill
Newburyport
Salisbury Beach
Gloucester
Marblehead
Salem
Lynn
Nahant
Cambridge
Somerville
Medford
Malden
Everett
Chelsea
Winthrop
Pt. Allerton
Hull
Nantasket Beach
Cohasset
Scituate
Marshfield
Duxbury
Hingham
Quincy
Weymouth
Braintree
Randolph
Canton
Norwood
Walpole
Norfolk
Foxboro
Brockton
Easton
Bridgewater
Whitman
Hanson
Pembroke
Hanover
Rockland
Abington
Stoughton
Sharon
Milton
Dedham
Needham
Wellesley
Natick
Framingham
Ashland
Sherborn
Hopkinton
Holliston
Millis
Medfield
Norwood
Westwood
Walpole
Medway
Milford
Hopedale
Mendon
Uxbridge
Blackstone
Millville
Bellingham
Franklin
Wrentham
Norton
Attleboro
N. Attleboro
Mansfield
Taunton
Raynham
Middleboro
Lakeville
Rochester
Marion
Wareham
Buzzards Bay
Bourne
Sandwich
Barnstable
Yarmouth
Dennis
Harwich
Chatham
Orleans
Brewster
Eastham
Wellfleet
Truro
Provincetown
Cape Cod
Plymouth
Kingston
Halifax
Plympton
Carver
Chiltonville
Manomet Pt.
Lookout Pt.
Elishas Pt.
Plymouth Bay
Duxbury Bay
Barnstable Bay
Cape Cod Canal
Mashpee
Cotuit
Hyannis
Centerville
Osterville
Falmouth
Woods Hole
Martha's Vineyard
Oak Bluffs
Vineyard Haven
Edgartown
Gay Head
Chilmark
W. Tisbury
Nantucket
Siasconset
Great Pt.
Monomoy Pt.
Nauset Beach
Nauset Harbor
Muskeget I.
Tuckernuck I.
Gravelly Is.
Chappaquiddick I.
Naushon I.
Pasque I.
Nashawena I.
Cuttyhunk I.
Penikese I.
Elizabeth Is.
Gooseberry Neck
Sakonnet Pt.
Pt. Judith
Newport
New Bedford
Fall River
Providence
Bristol
Warren
Barrington
Seekonk
Rehoboth
Dighton
Somerset
Swansea
Acushnet
Dartmouth
Mattapoisett
Fairhaven
Westport
Lakeville
Assonet
Berkley
Raynham
Taunton
Attleboro
Pawtucket
Central Falls
Woonsocket
Blackstone
Millville
Uxbridge
Milford
Hopedale
Mendon
Bellingham
Franklin
Wrentham
Foxboro
Norton
Mansfield
Easton
Stoughton
Sharon
Canton
Avon
Holbrook
Randolph
Braintree
Weymouth
Quincy
Hingham
Cohasset
North Scituate
Scituate
Norwell
Hanover
Rockland
Abington
Whitman
Hanson
Pembroke
Marshfield
Duxbury

The Hoosic Valley and the Berkshire Hills near Williamstown

By ordinary train one can travel from Boston to North Adams, almost the entire distance across the state, in about five hours. By the use of your scale of miles determine what the distance really is. How far is it across the state from north to south along the Connecticut Valley? The length of a degree of latitude is almost 70 miles. Using this scale, compare your results with those obtained by using the regular scale of miles. The average size of a state in the United States is 63,058 square miles. Compare Massachusetts with this. (See p. 55.) Compare Massachusetts with the total area of New England. Which is the largest state in New England? Which is the smallest? Compare Massachusetts with these. How many states of the size of Massachusetts could be made out of Texas?

Connecticut Valley from Mt. Holyoke

RELIEF

Massachusetts may be regarded as an elevated plain, or upland. It has a maximum height of more than 3000 feet in the northwestern section of the state and slopes gently to the sea toward the east and south. The rivers have cut deep and narrow valleys into this upland, giving the central and western parts of the state a rugged or even mountainous appearance. The beautiful Berkshire Hills are the highest portions of the state.

The Connecticut has cut a much broader valley than the other rivers because it runs over much softer rocks. This broad open valley (Fig. 92) separates the western from the eastern upland and extends across the

entire state from north to south. It is very narrow at the north but widens to about twenty miles on the southern boundary. This valley is perhaps the most valuable agricultural land in the state. Its open meadow lands very early attracted settlers from the Bay Colony, and some of the oldest towns in the state are located here.

Mt. Holyoke

Mt. Tom and Mt. Holyoke are conspicuous elevations in the valley and are made of hard rock which has not worn down so rapidly as the surrounding materials. Mt. Wachusett, standing on the upland, has had a similar origin.

The Berkshire Valley has been cut into the upland near the western border of the state, mainly by the Housatonic River. This, too, has been cut into soft rock, but is not so wide as the Connecticut and stands at a much higher altitude. The valley is noted for its beautiful scenery and is a fine farming country. Mt. Greylock, in the northern part of the valley, is the highest mountain in the state.

The eastern part of the state is the least rugged section. Here the rivers run in shallow valleys not far above sea level, and much of the country is a plain of moderate elevation.

All over the state the great ice sheet (Sec. 32) has left its materials in various forms, thus modifying the relief in many ways. Drumlins and moraines (Fig. 37) are common in the eastern sections of the state.

Massachusetts has a varied coast line. Cape Ann is a blunt and rocky headland projecting but a short distance out to sea, while Cape Cod is an arm of sand and gravel, which reaches far out into the Atlantic and incloses the waters of Cape Cod Bay (Sec. 82).

North of Cape Ann are the long sand bars of Plum Island and Salisbury Beach. Behind them are extensive salt marshes and lagoons. The Merrimack discharges most of its water between these barrier beaches, and its mouth is guarded by jetties to prevent the formation of bars. South of Cape Ann, along the northern shores of Massachusetts Bay, the coast is very rocky.

Boston Harbor is finely protected by a series of islands and by long barrier beaches connecting the islands with one another and with the mainland. The water is deep enough for large ocean-going vessels.

South of Boston the coast continues somewhat rocky, alternating with sandy stretches as far as Scituate. Beyond this it becomes sandy with occasional bowldery points.

DRAINAGE

The Connecticut River crosses the state from north to south and continues southward to Long Island Sound. On its western side it receives the Deerfield and the Westfield from the western upland. On its eastern side it receives the Chicopee and Millers from the central upland. These branches run in deep gorges. The Millers and the Deerfield at the north join the Connecticut Valley nearly opposite to each other, and the same is true of the Chicopee and the Westfield at the south. It is interesting to note that the two important railroad lines crossing the state from east to west follow these valleys through the larger part of their courses.

The Housatonic, farther to the west, flows southward through Connecticut, and the Hoosic flows northward into the Hudson.

The Hoosic Valley is separated from the Deerfield by the Hoosac Mountains.

In the east the Merrimack enters the state from New Hampshire and flows for about thirty-five miles through the northeastern corner of the state on its way to the ocean. The Concord joins the Merrimack at Lowell. The Charles flows eastward into Boston Bay, and the Blackstone and Taunton southward into Narragansett Bay. The Merrimack, Charles, and Taunton have tides at their mouths and are navigable for small craft for a short distance from the sea. The rivers of the state, however, possess very little value for navigation purposes, but such swift-flowing streams as the Deerfield, Millers, Westfield, Chicopee, Housatonic, and Hoosic rivers have large value as power producers. Such important manufacturing centers as Lowell, Lawrence, Holyoke, Chicopee Falls, Shelburne Falls, and Turners Falls owe their development to excellent water power furnished by falls or rapids.

A view from the summit of almost any New England mountain will show a large number of lakes and ponds of various sizes in the landscape. Massachusetts alone has hundreds of these lakes. They are mainly the results of glacial action (Secs. 30, 31, 32). Massachusetts was overrun by the great ice sheet which reached as far south as Nantucket, Martha's Vineyard, and the Elizabeth Islands. The glacial deposits were laid down unevenly, leaving basins in which water collected to form the lakes and ponds. In places glacial materials blocked up the valleys, causing the streams to expand into lakes or to change their courses. In this way not only were the lakes formed but as the rivers cut down their new channels and came to buried ledges, waterfalls and rapids were developed. The falls at Lowell and Lawrence were formed in this way (Fig. 88).

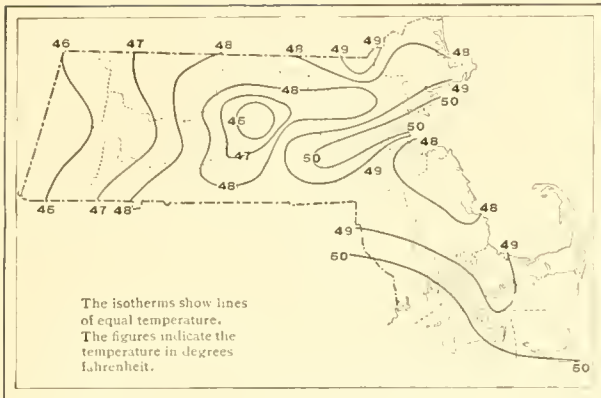
All over Cape Cod, and to the south and west of Plymouth, great numbers of lakes and ponds occur. Many of these are now in the process of filling, and many have become almost filled, thus forming swamps (Sec. 79).

The lakes are of great importance to the state. Where they are formed by river expansion they serve as reservoirs and tend to prevent floods, thus making the flow of water more constant. Most of the ice supply comes from these lakes, and many cities and towns obtain their water supply from them.

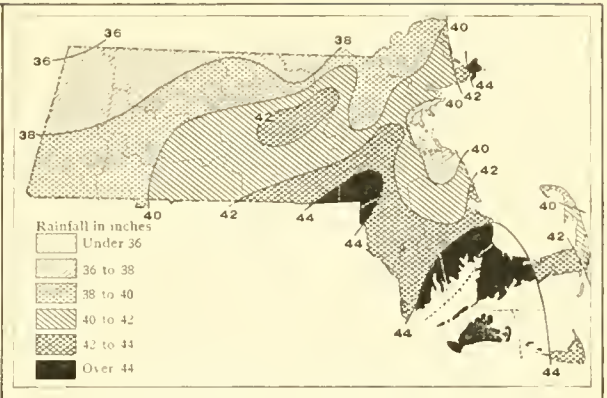
CLIMATE

Climate is always an important factor in the development of any country, and it has had its large influence upon the life of Massachusetts (Sec. 83). On the whole, the climate is healthful and favorable to agriculture. The winters are cold and the summers are hot. While the winters are severe, they are not cold enough to close the harbors or to kill the more hardy plants upon which men of the temper-

Holyoke Dam, Connecticut River. Mt. Tom in the distance



Mean annual temperature in Massachusetts



Mean annual rainfall in Massachusetts

ate zone have come to depend. The necessity of providing for the severe winters has doubtless done much to develop economy and thrift, traits of character for which the New Englander is noted.

Massachusetts lies in the belt of prevailing westerly winds. The winds of winter are mainly from the cold land to the north and west, while those of summer are from the southwest.

Rainfall is well distributed through the year, the growing crops usually getting a good supply, though droughts are not uncommon. The rainfall is supplied by the passage of cyclonic areas over New England (Sec. 61). The summer rains come mainly in the form of thunder storms associated with the cyclonic areas. The extreme changeableness of the New England weather is due to the passage of these cyclones and anticyclones.

Questions and Exercises.—1. From a study of the temperature charts on this page determine which are the warmer and which the colder parts of the state. Can you account for this difference? (Sec. 27.) 2. The average January temperature for the state as a whole is between 25° and 30°, and that of July is about 70°: determine the number of days in the growing season for the eastern and western sections (Fig. 71). Why is this difference?

3. From the chart on this page determine the average annual rainfall for the state as a whole.

4. Which part has the heaviest fall and which the lightest? Account for this.

5. Why is there much less snow on the coast than inland?

AGRICULTURE

Soil. — Much of the soil of Massachusetts was brought from the north by the great ice sheet (Sec. 32) and left spread out over the country as the ice melted away. This glacial soil is composed of clay, sand, and gravel, mixed with many bowlders of varying sizes. Glacial bowlders are common everywhere, often in such great numbers as to require a large amount of work in clearing the land.

The best soil for farming is in the broader valleys, where it is fine, deep, and fertile, and at the same time spread out in level tracts so as to be easily cultivated. The Connecticut Valley is an excellent example of this. The hill farms of the highlands are likely to have a rough surface, with a thin and rocky soil, and are much better suited to dairying than to agriculture.

In the Housatonic Valley the soil has been derived, in large part, from limestone rock, and in this respect is different from the soils in other sections of the state. This, too, is a good farming region.

In the eastern section of the state the soil is rather light, being in general a mixture of sand and gravel with varying proportions

of clay. The northern half of this section has more clay than the southern. The soil about Boston is very good for market gardening.

In the southeast corner of the state, including Cape Cod, are many swamps which have been formed by the partial filling of glacial lakes (Sec. 79). These are among the most valuable agricultural lands of the state, being excellent for the cultivation of cranberries.

The best farms are located in the valleys. Probably the very best are on the level floor of the Connecticut Valley (Fig. 19). In the more hilly sections of the state the high hilltops and steeper slopes have thin and rocky soils generally used as pasture lands, and dairying is important in those places. The lower hills and gentler slopes, with their thicker and finer soils, are generally used for farming lands. They are especially suited to fruit raising.

Forests. — It is probable that the entire state was originally wooded, with the possible exception of certain meadow lands in the wider river valleys. To-day approximately one half of the state is forest area or waste land. The early settlers had to clear the lands before they could do their farming.

Much of the land cleared in the early days was too rocky and hilly, or too sandy and gravelly, ever to make good farming land and was finally abandoned. On many of the abandoned farms young forests have grown up, and these reforested tracts are worth more than they ever were as farms. It is probable that there is more woodland in the state to-day than there was fifty years ago, though much of this is hardly more than waste land. Our forests have been wasted in the past, and little effort has been made to replant areas which have been cut or burned over. Massachusetts now has a State Forester who is arousing interest and teaching the people how to care for their forests and how to make these waste lands productive. The state is maintaining nurseries for the growth of young trees for transplanting, and these are distributed among the people at the lowest possible cost. The state is also buying waste land and reforesting it. Many laws are made to protect the forests against fire and pests in order to increase forest products. Even now, with the little care that has been given them, the forests are annually yielding products worth about $4,000,000. These come mainly from white pine and chestnut. The pine is extensively used for box boards and the chestnut for railroad ties.

Crops. — Massachusetts farms are usually small and a large proportion of them are of the rocky, hilly type, so that machinery cannot be extensively used as in the West. Much of the work must be done by hand or by simple machinery. The West, with its large farms, extensive use of machinery, and cheap freight rates, is able to supply Massachusetts with cereals cheaper than she can raise them herself. The Massachusetts farmer is therefore giving much of his attention to special crops. The numerous cities and large towns furnish him an excellent market for his produce. There is a large demand for vegetables, and market gardening is extensively carried on in the vicinity of the larger cities. The market-

Market gardens near Boston

A cranberry field, Cape Cod

garden farms about Boston are especially noted. The soil in that section is well adapted to this kind of farming, as is also that in the Merrimack Valley and parts of the Connecticut Valley. Such farms are most carefully cultivated, and are often made to yield two or more crops a year. The greenhouse is much used in this work, and some kinds of fresh vegetables are supplied throughout the winter.

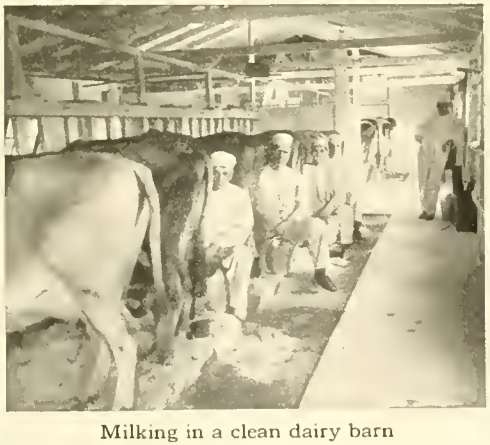
Nearly all the swamps of Cape Cod and many of those of Plymouth county have been converted into cranberry bogs. This is done by digging up the bushes and covering the exposed peat with a thin layer of sand. The low running cranberry vines are set out in this sand and in a few years yield large and profitable crops. The peat, sand, and climate of this section seem to be exactly suited to the growth of this fruit. About three fifths of all the cranberries produced in the United States are raised in Barnstable and Plymouth counties.

Large quantities of tobacco and onions are grown in the Connecticut Valley.

Hay, oats, and corn are crops of considerable value. These are used as food for horses and dairy cattle.

Fruit raising is an important branch of agriculture throughout the state and is increasing in importance. All the hardy fruits do well. Small fruits are raised in abundance for the local market. Apples, pears, peaches, and grapes of excellent quality are produced in good quantities. Much of the land, too rough for general cultivation, is being converted into profitable orchards.

Animal Products. — Dairying is a very important industry in the state. Massachusetts raises many fine cattle that furnish large amounts of milk and cream for the cities and towns. They cannot begin to furnish all that is needed, however. Every day trainloads of milk come into Boston, not only from the country towns of Massachusetts, but from nearly every part of New England (Sec. 86). Within a radius of 270 miles about Boston there are nearly 7000 farms contributing to the general milk supply. The production, transportation, and delivery of this milk is regulated by the city or state laws enforced by health authorities or dairy inspectors, in order to insure clean milk and prevent sickness. So much fresh milk and cream is sold that comparatively little butter and cheese are made. Massachusetts depends upon other states for these products.



Milking in a clean dairy barn

The demand for fresh eggs and poultry is so great that poultry raising is a very important branch of agriculture.

FISHING

Cod, haddock, halibut, bluefish, mackerel, and herring are a few of the many valuable food fish that inhabit the coast waters of the state.

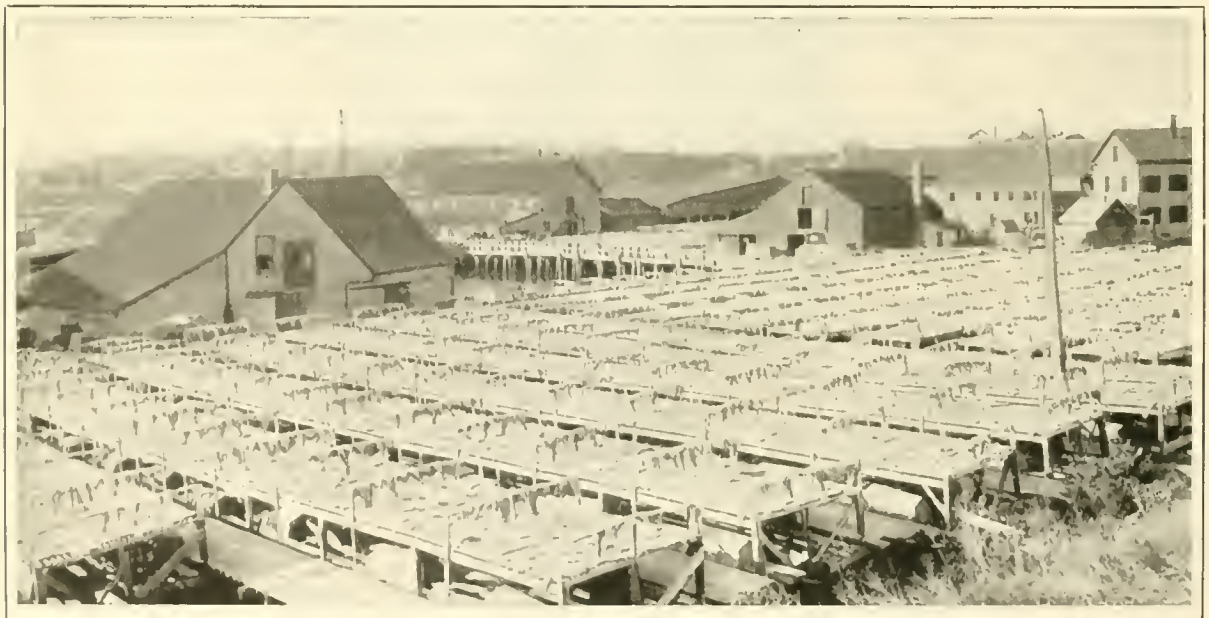
In the earlier days nearly every shore town with a small harbor had its own little fleet of fishing vessels. This was particularly true of Cape Cod. The business to-day is mainly centered at Gloucester, Boston, and Provincetown. Boston is the most important fishing port in the country (Sec. 95).

The fishing industry is mainly carried on by fishing vessels fitted out especially for this work, several hundred of which sail from the ports of Massachusetts. They visit the "Banks" off the coasts of Newfoundland and New England, where large numbers of cod, haddock, and halibut are taken. The fresh fish are sold direct to the markets or put in cold storage, where they may be kept for a long time. Codfish that are salted are dried in the sun. Many of them are then boned, shredded, packed in boxes, and sold as boneless or shredded codfish. Gloucester and Provincetown do a large part of this work (Fig. 108).

Setting a purse net

Mackerel and bluefish swim in large schools near the surface. When a school is discovered, the fish are surrounded by a great net or seine, which is carefully drawn in from the bottom, forming a pocket or purse from which the fish cannot escape. Large numbers may be taken at once in this way. These fish are iced or salted, and in either form find a ready market.

Many fish, such as mackerel, bass, bluefish, and squeteague, are taken in weirs along the shores. These are huge fish pens so built



Drying salt fish at Gloucester

that schools of fish, swimming along the shore, will easily find their way into them but cannot find their way out. These weirs may be seen reaching off from shore on the inner side of Cape Cod as one drives from Barnstable to Provincetown.

Lobsters are taken in large quantities from the rocky bottoms along the shores. They are caught in traps, or pots as the fishermen call them, and are in such demand in the markets that the supply is in danger of being exhausted. State laws regulate the size of those that may be taken.

Clams, oysters, and scallops are taken from the flats and shallow waters along the shore. From the time of the earliest settlement these have been sought as food supplies and there is danger of exhaustion. Certain varieties are already very scarce, and the state is attempting to protect them by laws governing the sizes and quantities that may be taken, as well as the methods that may be employed in the taking. Shore reservations are granted to individuals or companies for the growth of oysters and clams, and protection is given in these rights. Many of these reservations on Cape Cod are producing large quantities of fine oysters. By proper care much larger food supplies may thus be obtained.

A granite quarry, Quincy

The national government maintains hatcheries and distributes the young of various species of fish in the waters along the coast. Such a hatchery is maintained at Woods Hole.

MINING

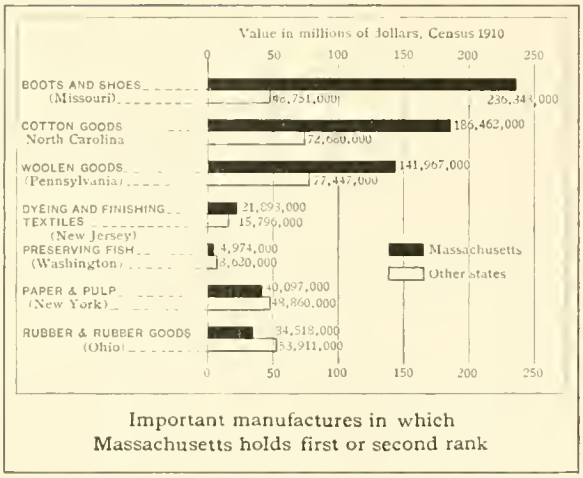
Granite is Massachusetts' largest mineral product. The Quincy granite is most widely known. This is of excellent quality and is extensively used for building and for curb and paving stones. It takes a beautiful polish and is therefore widely used for monumental purposes. The Quincy quarries were among the earliest to be opened in New England. In 1827 a short tramway was built from one of the quarries for the transportation of granite by horse power. Many believe that this was the first railroad to be built in New England. A part of the old road may still be seen at the quarry in West Quincy. Granite of good quality is also quarried at Gloucester, Rockport, and Fitchburg. It occurs in many other places.

In the western part of the state marble of good quality is found at North Adams, Lee, Egremont, and Sheffield. That at Lee is best known. These marbles are all used for building purposes.

Limestone, suitable for making lime, is found and worked in several small quarries in the Hoosic and Housatonic valleys.

Sandstone, of an excellent quality for building, is quarried at East Longmeadow in the Connecticut Valley. This is the famous "brownstone," so extensively used in the past for the building of fine residences. Other building stones seem to be taking its place at present and the quarrying has been greatly reduced.

At Chester there is the largest emery mine in the country. This material is made into



Important manufactures in which Massachusetts holds first or second rank

various forms for polishing metals and sharpening tools. The emery powder, paper, and wheels are in general use.

The pyrite, found near Davis in the western part of the state, is valuable for the manufacture of sulphuric acid.

Clays are widely distributed over the state and are extensively used in the manufacture of bricks and tiles.

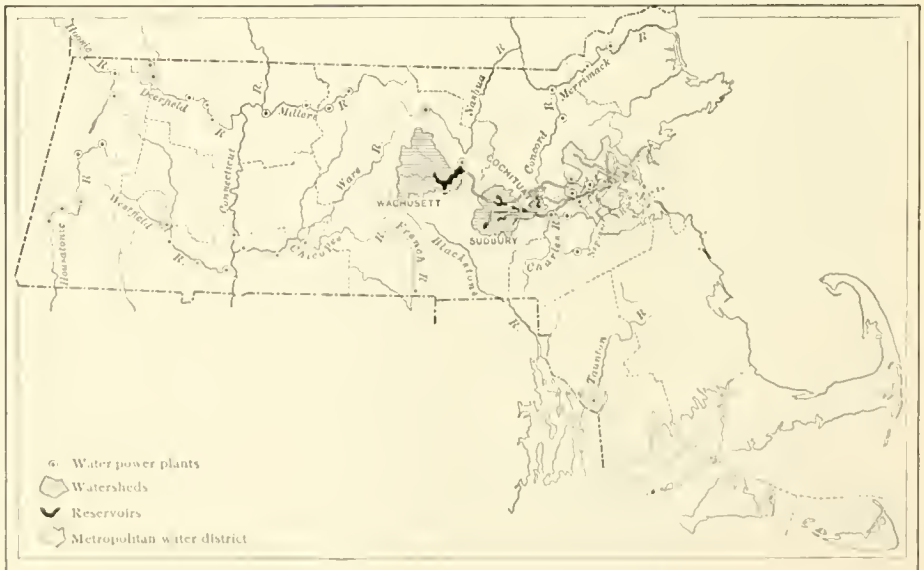
The fine roads which Massachusetts is building are made possible by the abundance of rocks for the making of crushed stone, and the sand and gravel so extensively used in the road-making process.

MANUFACTURING

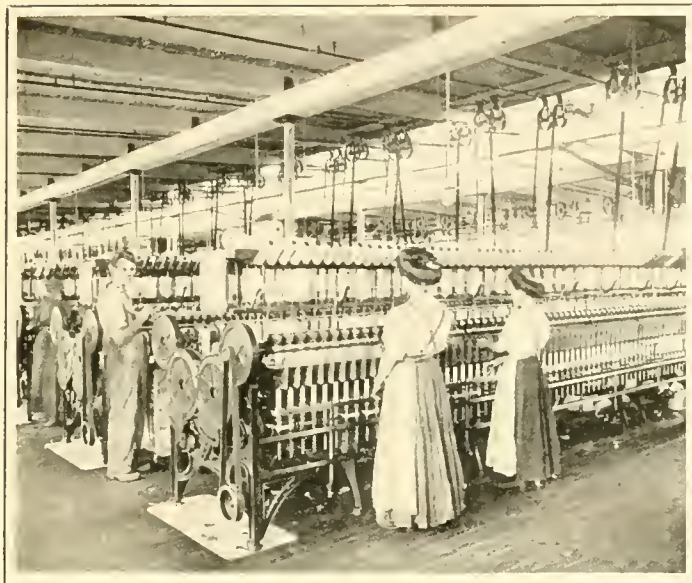
Early Development. — Massachusetts is one of the leading manufacturing states of the country, ranking as third in the country at large and first in the New England states. There are nearly as many people engaged in this occupation alone as in all others of the state combined. About seven or eight times as many people are employed in this industry as are engaged in operating all the farms of the state.

In the early days Massachusetts supplied her own raw materials and used her streams for power. To-day steam has largely taken the place of water power, although water power is being extensively developed. Electric plants are being built on the streams, and the electricity, generated by water power, is transmitted to the places where it is needed. Massachusetts produces no coal and must bring from other states what she needs for making steam. Practically all raw materials must also be obtained elsewhere. This lack of coal and raw material is a serious handicap to the state. Her early start in business, however, has given to Massachusetts large plants and great numbers of skilled workmen. Her excellent harbors and railroads enable her to get the coal and raw material with ease, and to ship away her manufactured goods. Nearness to the great centers of population in the East gives excellent markets, and her position is most favorable for foreign trade.

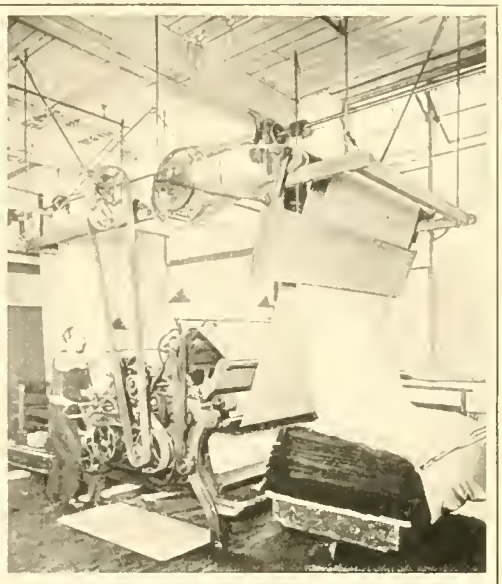
Manufacture of Textiles.—The manufacture of textiles is the leading industry of the



Location of important water power plants and metropolitan water district



Twisting room in a woolen mill



Shearing cloth in a woolen mill

state. In general it includes the manufacture of all kinds of cotton, woolen, silk, and linen goods. Only the first two, however, are of great importance in the state, and in the manufacture of these Massachusetts holds first rank in the country.

Woolen mills are widely scattered throughout the state. For the most part, however, the industry is concentrated at a few centers and is carried on in very large mills. Lawrence, Lowell, and Worcester are the most important centers. Clinton manufactures carpets. Very little wool is now raised in Massachusetts, and the mills have to depend upon other sections for it. Boston is the greatest wool market in America.

The cotton industry was also early developed. It did not come quite as early, however, as the woolen, perhaps in part because the cotton could not be raised in this climate. With the development of the industry has come an ever increasing demand for raw cotton. At first it was difficult to raise and prepare enough for the market, largely because of the difficulty of ginning, that is, the stripping of the cotton fiber from the seed. The invention of the cotton gin by Eli Whitney in 1792 removed this difficulty and increased the quantity of cotton for manufacture. The tendency in this, as in the woolen industry, is to gather about a few important centers in very large mills. Fall River, New Bedford, and Lowell are the great cotton-manufacturing cities of the state. There is such a demand for labor in these great mills that many immigrants find employment in them. All kinds of cotton goods are manufactured. They find a market all over the world, but the largest quantity is sold in our own country. Vast numbers of people find employment in the handling of these goods.

The Tanning Industry.—Ever since its beginning tanning has been an important Massachusetts industry. It is interesting to note that it has had its principal development in the towns very near the point where it began in eastern Massachusetts. Peabody, Lynn, Salem, and Woburn are the important centers to-day. The hides first used were those of cattle and sheep raised in the community. To-day Massachusetts obtains nearly all the hides used in her tanneries from outside. Boston is the principal market for hides and leather.

Boots and Shoes.—The largest use of leather is in the manufacture of boots and shoes. Massachusetts stands first in this industry. This state makes nearly five times as many shoes as are made in any other state and nearly half of all that are made in the country. The great bulk of the business is in the eastern section of the state, particularly in towns within easy reach of Boston, which is the great trade center for leather and shoes. The larger manufacturing centers are Lynn, Brockton, and Haverhill, though many other cities and towns are large producers.

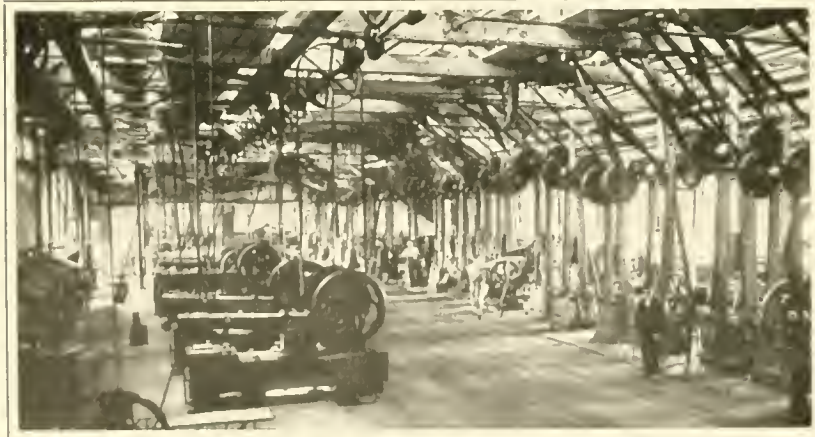
Stitching shoes, near Brockton

Metal Manufactures.—In the early days Massachusetts, even with her meager supply of ore, was the leader in all kinds of iron manufacturing. This is not true to-day, but the industry is still very large indeed. The business is now mainly of such a character as to call for much skilled labor and comparatively little metal and coal. This means the development of special lines of work.

The great manufacturing business in the state calls for a vast amount of machinery, often of the most delicate character. This machinery, in large measure, has been invented and manufactured near the locality where it is used. It thus happens that the manufacture of machinery has become the leading metal industry of the state. Machine shops are widely scattered and are to be found in every important manufacturing center. Besides Boston, Worcester may be regarded as the most important center for the manufacture of machinery. Artisans' tools of fine grade are manufactured in great numbers and in great variety.

Waltham watches are among the most famous in the world. They are made entirely by a series of most wonderful machines. So accurate are these machines in their work that the watch is said to be as accurate a timekeeper as the hand-made watch of Switzerland.

Stoves are manufactured at Taunton and Watertown, electrical appliances at Lynn, and agricultural implements at Framingham, Chicopee Falls, and Easton. These are but a few of the great number of metal manufactures of the state. Wire goods, cutlery, firearms, and cartridges, rolled brass and copper, silver and plated ware, bicycles, automobiles, and sewing machines are among the many others constituting the great variety of Massachusetts products.



Shops where firearms are made for the U.S. Government, Springfield

The Paper Industry.—Massachusetts ranks second

Machine room in a paper mill, Holyoke

Beater room in a paper mill, Holyoke

among the states in the production of paper (Fig. 42). Water power is extensively used in the manufacture and a large amount of water is necessary in the process. For these reasons we find the industry largely centered in the Connecticut and Berkshire valleys, either upon the large rivers or their tributaries. The paper manufactured in this section is made in large measure from linen rags and is of a high grade. Holyoke is not only the greatest paper center of the state, but of the country as well. Its mills turn out more than three hundred tons of fine paper each day. A large part of this is writing and book paper. Dalton, near Pittsfield, is famous for its production of the fine paper from which the government bank notes are made. Fitchburg, Lawrence, and Walpole are important paper centers outside of the Connecticut and Berkshire valleys. Massachusetts does not manufacture large quantities of newspaper. This is made from wood pulp and is generally manufactured near the pulp mills. Maine and New Hampshire have the larger part of this business.

TRANSPORTATION

The great industries of Massachusetts make necessary a good system of transportation. Raw materials and fuel must be provided for the factories, manufactured goods must be sent to market, and business men must be able to travel swiftly in all directions. Massachusetts has therefore developed a very complete system of steam and electric roads.

Most of the railroads of Massachusetts were originally independent lines, but have now been combined, for the most part, into two great systems, the New York, New Haven, and Hartford, and the Boston and Maine. In general the Boston and Maine system covers northern New England and connects Massachusetts with that region and with the Canadian roads running to the west. The New York, New Haven, and Hartford system covers southern New England and connects Massachusetts with Rhode Island, Connecticut, and New York. There are two main lines extending across the state from east to west. The Fitchburg division of the Boston and Maine lies to the north. It passes through Fitchburg, follows the Millers and Deerfield valleys, passes through the Hoosac Tunnel, and terminates at Troy, New York. The Boston and Albany lies to the south, passes through Worcester and Springfield, follows the Chicopee and Westfield valleys, and terminates at Albany. These roads make connections with the great trunk lines that extend to the North Central States.

The electric railways connect not only the populous centers, but many of them extend far out into the rural sections of the state. They are greatly stimulating country life and have added much to the value of farm property.

Massachusetts is also developing a most excellent system of state highways, perhaps the best in the country. The cities, towns, and counties are also building many new roads, and the state is aiding them liberally with money and advice. Approximately one thousand miles of state highway have already been built. The building of these highways has been greatly stimulated by the advent of the automobile. These roads are especially beneficial to the rural sections. Many of our most attractive summer resorts, heretofore, hard to reach, are now very accessible. Very heavy loads can be hauled easily over these well-kept highways.

Numerous lines of steamers center at Boston, connecting with both foreign and domestic ports. The recently completed Cape Cod Canal greatly decreases the distance and danger for shipping between Boston and New York. Fall River and New York are connected by steamers.

A state highway in Massachusetts

GOVERNMENT

In the government of the state there are three separate departments,—the legislative, executive, and judicial. The legislative department makes the laws, the executive executes them or carries them into effect, and the judicial decides questions of law and justice.

The legislature of Massachusetts is called the general court and is the oldest legislative body in the country. The senate has forty members and the house of representatives two hundred and forty. These are elected annually by the people.

The executive department consists of a governor and his council, a lieutenant governor, secretary of state, treasurer, auditor, and attorney general. These officers are elected annually by the people. The governor is the chief executive.

The judicial department consists of the various courts of the state. The judges of the higher courts are appointed by the governor with the advice and consent of the council, and hold office during good behavior.

Cape Cod Canal

The county, in Massachusetts, is not a prominent unit in government as it is in many of the other states. Its organizations are mainly associated with the work of the courts, though some of the highways and bridges come under the care of county commissioners.

The town has played an important part in the government from the beginning. The town meeting is a New England institution. The church, the school, and the town hall have generally stood side by side and suggest the New England idea of government. At these annual town meetings each voter has a direct voice in the government of his town. Matters relating to the common welfare are discussed and voted upon. Money is raised and appropriated for the general expenses of the town, such as the care of the schools, the roads, the poor, the fire department, and the police department. Officers are elected to attend to the town business through the year. These officers are generally a board of selectmen and assessors, a treasurer, a clerk, and a tax collector. The annual town meeting is a good example of a democratic form of government.

Statue of John Harvard, Harvard University

When a town gets to be too large for this form of government, it may become a city and adopt a representative system. The people elect a mayor and a board of aldermen. They together constitute the city council. This council is given power to pass such measures as may be necessary for the government of the city. Other officers may be appointed by the mayor or elected by the people.

EDUCATION

Massachusetts has always believed that public education is a necessity to a self-governing people. She has therefore spent money freely in the education of her citizens. As early as 1647 a law was passed making it necessary for every town of fifty or more householders to provide a "schoolmaster" for the instruction of her youth. This was the beginning of the present public school system. To-day there are approximately 17,000 teachers employed in these schools and more than half a million boys and girls attend them. More than twenty million dollars a year are spent in maintaining the schools. The law requires that all children shall attend school between the years of seven and fourteen. Every boy and girl in Massachusetts has the opportunity of acquiring a high-school education at public expense. In addition to the public schools there are many fine academies and private schools. About one sixth of the boys and girls of the state attend these private schools.

A state board of education, appointed by the governor, has the general supervision of education in the state. The secretary of this board is practically the state superintendent.

The schools of each town are under the control of a school committee elected by the people. Every town is required by law to employ a local superintendent whose duty it is to direct the work of the schools. Several towns may combine and employ a superintendent whose salary is paid, in part, by

the state. This enables smaller towns to receive better supervision.

Those who wish to continue their education beyond the high school find ample opportunity in the various colleges and other institutions of higher learning. Among the colleges for women are: Wellesley College at Wellesley, Simmons at Boston, Radcliffe at Cambridge (Harvard), Smith at Northampton, Mt. Holyoke at South Hadley, Lasell at Auburndale, Wheaton at Norton, and Jackson at Medford (Tufts).

Among the institutions for men, Harvard University is the largest and most widely known. It was founded in 1636, only six years after the settlement at Boston, and is the oldest institution for higher learning in the United States. The other important institutions are Amherst College at Amherst; Clark University, Clark College, College of the Holy Cross, Worcester Polytechnic School, all at Worcester; Tufts College at Medford; Williams College at Williamstown; Boston College, Boston University, at Boston; and the Massachusetts Institute of Technology at Cambridge.

The state also maintains ten state normal schools for the training of public school teachers. The Normal Art School for the training of art teachers is located at Boston. The other normal schools are at Bridgewater, Fitchburg, Framingham, Hyannis, Lowell, North Adams, Salem, Westfield, and Worcester.

The State Agricultural College at Amherst

Library, Smith College, Northampton

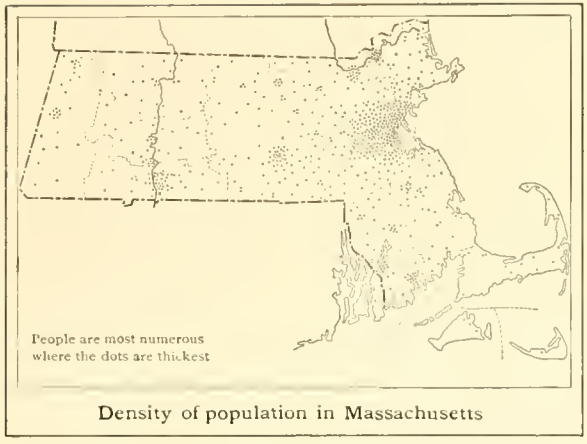
is for the training of those who wish to become skilled in agriculture either as teachers, overseers, or practical farmers. The College is also attempting in various ways to help the farmers of the state to do more scientific farming. Other independent agricultural schools and some of the high schools are being encouraged by state aid to give instruction in practical agriculture. An increasing number of industrial schools of various kinds are being maintained at public expense in different sections of the state.

POPULATION AND CITIES

Massachusetts is a very densely populated state. In 1910 on an average 418 persons lived on each square mile of its area. In the United States as a whole there were only 31 persons to the square mile. Rhode Island, with 508 to the square mile, was the only state with a greater density.

The total population of the state is 3,693,310 (State census, 1915). Approximately two thirds of all these people live within a

Massachusetts Institute of Technology, Cambridge



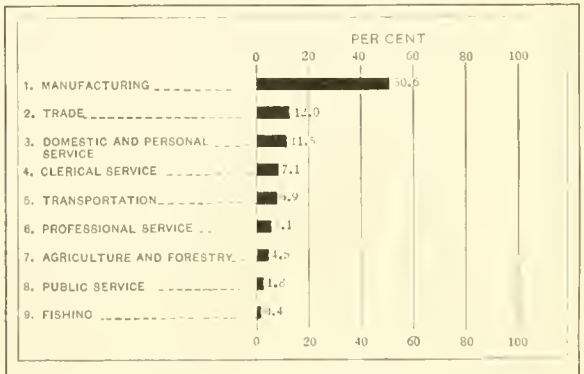
Density of population in Massachusetts

radius of thirty miles of Boston. Bristol County to the south and Hampden County in the Connecticut Valley are also quite densely populated (Table II). The western upland, lying west of the Connecticut, and the Cape Cod section, are the least densely populated portions of the state. The central upland has a somewhat denser population than the western upland.

In agricultural regions people are widely separated or live in small villages. In industrial and commercial sections, where many workmen are needed, they must live near together. In 1915 Massachusetts had thirty-five cities. Twenty-six of these and one town had a population of more than 25,000 each. Four of the cities lie in the Connecticut Valley, two to the west of it, and twenty-nine to the east of it. The excellent water power on the Merrimack (Fig. 88) and at Fall River gave manufacturing an early start at these points, and with the introduction of steam these factories were enlarged and many others sprang up. These mills had the advantage also of being near good harbors. Boston, because of its position and excellent harbor, became the great railroad and commercial center of New England. Manufacturers find it greatly to their advantage to be near such a city as this. They have therefore built many factories in the towns about Boston. Often their main offices are in the city and a large part of the buying and selling for the mills is done here. Raw materials are easily obtained and manufactured goods are easily put upon the market because of the excellent shipping facilities.

The demand for workmen has been so great in these industrial centers that large numbers have come from abroad. Nearly one third of the total population of the state is foreign born. Of the remaining two thirds, about one half have had one parent born abroad. Most of these people are engaged in the industrial centers, but many of them are taking up neglected farm lands of the state and are thus adding materially to its agricultural wealth.

Boston.—Boston is the metropolis of New England, and is the fifth city of the United States in population. It has an extensive commerce both foreign and domestic. Its trade with foreign lands is excelled only by New York. The growth of the city is mainly due to its fine harbor and excellent position. A glance at the map of Massachusetts will show its fortunate position. Boston Bay deeply indents the coast and Boston lies on the extreme western shore. This takes the city well into the body of the state and makes the harbor more available than any other on the coast. Railroads naturally center at such a point, and Boston has become the greatest railroad center of New



Proportion of persons engaged in each class of occupations in Massachusetts, Census 1910

England. The harbor itself is well protected by various headlands and islands and has a good depth of water. It has been necessary, however, to do some dredging for the larger ocean steamers. Boston Harbor is a very busy place, with its miles of docks and great variety of vessels.

Vestibule, Boston Public Library

In common with most large cities Boston has many large and varied industries and is a very important trade center. The preparation of food products, including an extensive sugar-refining business, the manufacture of clothing, boots and shoes, and the publishing of many books, constitute only a few of the many lines of industry. It is the greatest wool and leather market in America. Vast quantities of cotton and other commodities are also distributed from this port. The city is also the great banking center of New England.

The original site of Boston was a hilly peninsula, joined to the mainland by marshes. As the city has grown, these marsh lands have been filled in at great expense and are now covered with many fine residences and business establishments. The Back Bay District is a part of the area thus "reclaimed." The city now covers many miles of country surrounding the original site.

A great many of the people doing business in Boston have their homes in the various towns surrounding the city. This is possible because of the excellent transportation facilities, both steam and electric. In years gone by the people who made their home in Boston were mainly New Englanders. To-day the city is the home of thousands who have come to these shores from foreign lands.

Few cities offer better opportunities for education. The public schools are among the best and there are many institutions of higher education, both within the city and in the nearby towns. Boston has long been known as a literary and educational center. The city has played an important part in the history of our country and has many places of historic interest.

An extensive system of parks and driveways encircling the city has been developed. The Metropolitan Park System, under the direction of the state, lies outside of the city system and includes sea beaches, drives, forest lands, and playgrounds for Greater Boston.

Boston Harbor

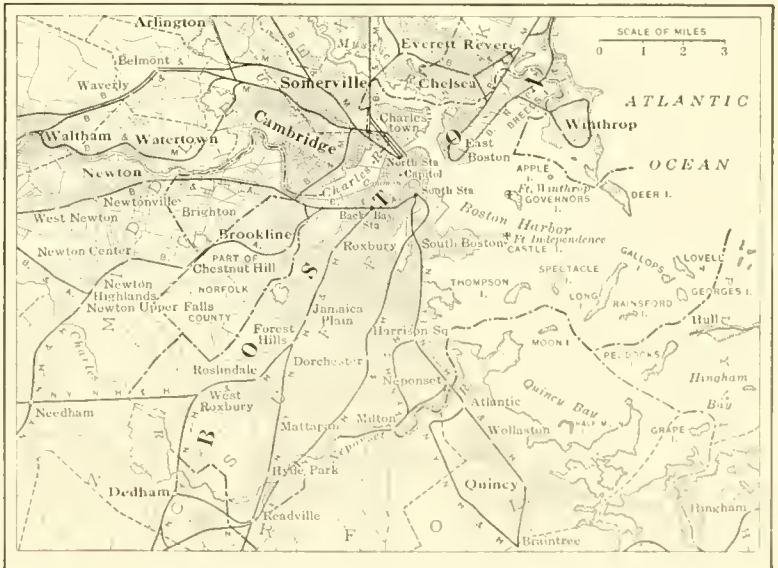
Cambridge Bridge across the Charles River to Boston

These recreation areas mean much for a community of such dense population.

The problem of supplying a great city with pure water is always a large one. The Metropolitan Water District includes Boston and many of its suburban towns and cities. The water supply for this district comes from numerous reservoirs to the west of the city. The most important of these are Cochituate, Sudbury, and Wachusett. The one at Wachusett is nearly forty miles from Boston. Great care is taken to keep the water in these reservoirs free from all impurities, as the health of so many people depends upon it.

There are a dozen cities within ten miles of the city limits of Boston. These are **Cambridge, Lynn, Somerville, Malden, Newton, Everett, Quincy, Chelsea, Waltham, Medford, Revere,** and **Melrose.** The town of **Brookline,** with a population of nearly 30,000, is almost surrounded by parts of Boston. It is the largest town in Massachusetts. These cities and towns, with several others of large size, make up a population practically continuous with that of Boston, and are largely residential.

Cambridge, lying just across the Charles River, is connected with Boston by several large bridges. It is noted as the seat of Harvard University. It is a beautiful residential city and has been the home of many famous people, among whom are Agassiz, Holmes, Longfellow, and Lowell. Although this city is best known as an educational and literary center, it has large manufacturing interests. The preparation of food products, the manufacturing of machinery, and printing are the leading industries. The old historic towns of **Lexington** and **Concord** lie a few miles to the northwest of the city.



Boston and vicinity

Somerville, adjoining Cambridge and Charlestown, is also a residential section but with important manufacturing interests. Slaughtering and meat packing is the largest business.

The other cities and large towns in the vicinity of Boston are largely residential, with a great variety of industries. **Waltham** is noted for its watches, **Woburn** for its leather, **Newton** and **Brookline** for fine homes, and **Quincy** for its granite and its shipbuilding plant at Fore River, where many vessels are built.

Lynn, **Brockton**, and **Haverhill** are the largest shoe-manufacturing cities in the entire country. **Marlboro**, **Newburyport**, and **Salem** are also large producers of shoes, as are many of the towns of Plymouth County. **Fall River**, **New Bedford**, and **Lowell** stand first in the manufacture of cotton goods. **Lawrence**, known as the "Worsted City," holds first rank in the woolen industry. Many great woolen mills are located here. **Attleboro** is an important jewelry center, and **Taunton** manufactures a variety of metal goods.

Salem, rich in historic interest, is a quaint old city on the rocky coast just north of Lynn. It has a small but well protected harbor. In the early days it was an important commercial center with a large foreign trade. With the growth of Boston, Salem has lost its foreign commerce and now has only coastwise trade. The principal industry to-day is the manufacture of boots, shoes, and leather.

A watch factory, Waltham

Wachusett Dam and Reservoir

Just across the harbor, on a rocky headland, lies the old historic town of **Marblehead**. Its snug little harbor, the delightful sea breezes, and interesting shore line make this a most attractive summer resort and yachting center. The entire coast from Beverly northward has many beautiful summer homes. **Gloucester**, on the south side of Cape Ann, is widely famed as a great fishing port.

Worcester is next in size to Boston. This city is an important railroad center. It has a wide range of industries, but is especially noted for its foundries and machine shops. It is the great supply center for the surrounding towns. Worcester is noted for its many educational institutions. **Fitchburg**, to the north of Worcester, is an important manufacturing and railroad center.

Springfield, **Holyoke**, **Chicopee**, and **Northampton** are the four Connecticut Valley cities. In this section both agriculture and manufacturing thrive. Springfield is the leading city of the group. It is located near the point where the Chicopee and the Deerfield join the Connecticut. This fortunate location has made it an important railroad center and has greatly influenced its growth. The city is an important manufacturing and trade center. The United States Armory and Arsenal are located here, and firearms are among its leading manufactures. Holyoke ranks first in the state and nation in the production of paper. The product is principally of the finer grades. Its water power is excellent. Northampton and Chicopee have a great variety

of manufactures. Smith College is located at Northampton.

Pittsfield, in the Housatonic Valley, is a very attractive residential city. The valley itself is a fine agricultural section and many of the towns in this beautiful Berkshire region are popular summer resorts. Pittsfield shares in this and is also an important industrial center. **North Adams** is an industrial city at the western entrance to the Hoosac Tunnel.

REVIEW

Questions and Exercises.—1. Describe the four physical divisions of the state. 2. Which section of the state is the highest and which is the lowest? 3. Account for the wide Connecticut Valley. 4. Account for the rugged character of the western section of the state. 5. Contrast Cape Cod and Cape Ann.

6. Name the six largest rivers of Massachusetts. 7. Where are they best suited for power? Why? 8. Why do railroads so often follow the river valleys? 9. Account for the numerous lakes of the state. Of what use are they?

10. What part of the state has the least rainfall? Account for this. 11. What is the average annual rainfall and temperature for your locality? 12. Why is the weather of Massachusetts so changeable? 13. In what direction is the prevailing wind of winter and summer? 14. How has the climate of Massachusetts influenced the people?

15. Why is it desirable that we should have more forests? 16. Account for the large amount of waste land in the state. 17. What is the state doing to improve the forests?

18. How has most of the soil of Massachusetts been formed? 19. Account for the thin soil on steep slopes. 20. Account for the many bowlders scattered over the state.

21. Why has not agriculture become a more important industry in Massachusetts? 22. What is the state doing to encourage it? 23. What is the character of the farming now being done? 24. What are the best agricultural areas? 25. What fruits can be profitably raised in Massachusetts? 26. In what sections is market gardening carried on?

27. What centers are engaged in the fishing business? 28. Describe the business as it is carried on at Gloucester. 29. Tell of the different kinds of fish and the methods employed in capturing them.

30. What is the leading occupation of the state? 31. In what manufactures does Massachusetts stand first? Account for this. 32. Why has Massachusetts become such an important manufacturing state? 33. In what way is the state at a disadvantage in manufacturing? 34. Why has manufacturing centered so largely about Boston? 35. How is the state utilizing its water power?

36. Describe the railroad system of the state. 37. Why have so many railroads centered at Boston? 38. How are electric roads affecting the state? 39. What is being done for good roads in Massachusetts?

40. What proportion of the people of Massachusetts are foreign born? 41. Describe and account for the distribution of the population. 42. Why are the towns in the hilly sections generally located in the valleys? 43. How is Boston supplied with water? With milk? 44. What cities are noted for: fishing? woolens? cotton? shoes? paper? 45. Account for the location of Lowell, Fall River, Holyoke, Springfield, Worcester. 46. Name the five largest cities of the state.

TABLES

TABLE I.—STATE OR COUNTRY OF BIRTH OF THE PEOPLE OF MASSACHUSETTS. CENSUS OF 1910

Native born	2,307,171	Foreign born	1,059,245
Native to state	1,861,820	Canada	297,369
Maine	94,515	Canada-French	134,659
New York	77,522	Ireland	222,867
New Hampshire	64,503	Russia	117,261
Vermont	41,439	England	92,658
Connecticut	38,505	Italy	85,056
Rhode Island	32,553	Sweden	39,562
Pennsylvania	15,661	Austria	35,455
New Jersey	8,677	Germany	30,555
Virginia	7,961	Scotland	28,416
Illinois	6,253	Portugal	26,437
Ohio	5,787	Turkey	16,138
Michigan	5,230	Greece	11,413
North Carolina	3,832	Finland	10,744
Maryland	3,520	France	5,926
Wisconsin	2,242	Norway	5,432
Minnesota	1,875	Denmark	3,405
Georgia	1,787	West Indies	2,287
Missouri	1,752	Hungary	1,996
Iowa	1,672	China	1,873
South Carolina	1,624	Belgium	1,745
Indiana	1,612	Holland	1,597
Lousiana	1,537	Wales	1,513
All other states	14,045	Switzerland	1,341
Territories, outlying possessions, etc.	11,247	All other countries	18,199

TABLE II.—POPULATION OF THE COUNTIES OF MASSACHUSETTS, 1915

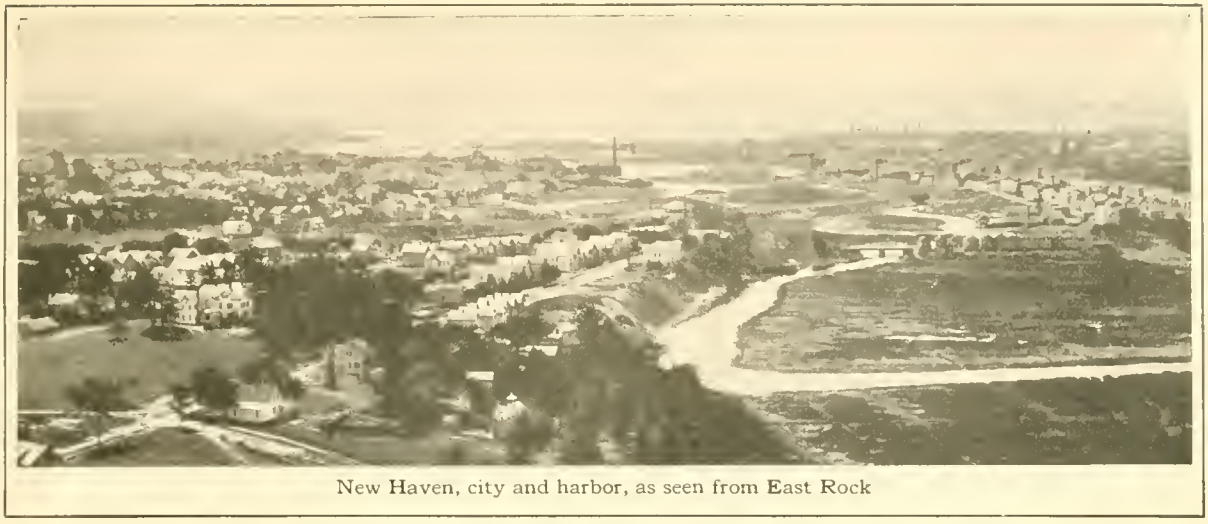
County		County	
Barnstable	28,818	Hampshire	69,549
Berkshire	114,709	Middlesex	733,624
Bristol	346,964	Nantucket	3,166
Dukes	4,904	Norfolk	201,907
Essex	463,662	Plymouth	157,303
Franklin	48,256	Suffolk	826,801
Hampden	262,944	Worcester	430,703
	The State	3,693,310	

TABLE III.—POPULATION OF CITIES AND TOWNS HAVING 2500 OR MORE INHABITANTS, 1915

Boston	745,439	Plymouth	12,926	Blackstone	5,689
Worcester	162,697	Wakefield	12,781	Abington	5,646
Fall River	124,791	Winthrop	12,758	Canton	5,623
New Bedford	109,568	Greenfield	12,618	Amherst	5,558
Cambridge	108,822	Webster	12,565	Lexington	5,538
Lowell	107,978	West Springfield	11,339	Walpole	5,490
Springfield	102,971	Danvers	11,177	Orange	5,379
Lynn	95,803	Natick	11,119	Dartmouth	5,330
Lawrence	90,259	Dedham	11,043	Milbury	5,295
Somerville	86,854	Norwood	10,977	Tewksbury	5,265
Brockton	62,288	Saugus	10,226	Hingham	5,264
Holyoke	60,816	Winchester	10,005	Chelmsford	5,182
Haverhill	49,450	Easthampton	9,845	South Hadley	5,179
Malden	48,907	Athol	9,783	Wareham	5,176
Chelsea	43,426	Palmer	9,468	Easton	5,064
Newton	43,113	N. Attleboro	9,398	Monson	5,004
Quincy	40,674	Bridgewater	9,381	Barnstable	4,995
Fitchburg	39,656	Ware	9,346	Uxbridge	4,921
Pittsfield	39,607	Braintree	9,343	Randolph	4,734
Everett	37,718	Northbridge	9,254	Agawam	4,555
Salem	37,200	Middleboro	8,631	Lee	4,481
Taunton	36,161	Milton	8,600	Dudley	4,373
Brookline	33,490	Amesbury	8,543	Rockport	4,351
Medford	30,509	Belmont	8,081	Provincetown	4,295
Waltham	30,154	Andover	7,978	Warren	4,268
Chicopee	30,138	Montague	7,925	Templeton	4,081
Revere	25,178	Marblehead	7,606	Dracut	4,022
Gloucester	24,478	Whitman	7,520	Williamstown	3,981
Beverly	22,959	Stoneham	7,489	Falmouth	3,917
North Adams	22,035	Swampscott	7,345	Dalton	3,858
Northampton	21,654	Rockland	7,074	Foxboro	3,755
Peabody	18,625	Stoughton	6,902	East Bridgewater	3,689
Attleboro	18,480	Reading	6,805	Medfield	3,648
Westfield	18,411	Maynard	6,770	Hardwick	3,596
Leominster	17,646	Hudson	6,758	Barre	3,476
Melrose	16,880	Concord	6,681	Oxford	3,476
Watertown	16,515	Great Barrington	6,627	Somerset	3,377
Woburn	16,410	Needham	6,542	Leicester	3,322
Gardner	16,376	Franklin	6,440	Auburn	3,281
Framingham	15,860	Wellesley	6,439	Westport	3,262
Newburyport	15,311	Fairhaven	6,277	Billerica	3,246
Marlboro	15,250	Ipswich	6,272	Lenox	3,242
Arlington	14,889	Ludlow	6,251	Holbrook	2,948
Southbridge	14,217	Grafton	6,250	North Brookfield	2,947
Methuen	14,007	Spencer	5,994	Manchester	2,945
Weymouth	13,969	North Andover	5,956	Medway	2,846
Milford	13,684	Westboro	5,925	Westford	2,843
Adams	13,218	Winchendon	5,908	Pepperell	2,839
Clinton	13,192	Mansfield	5,772	Sutton	2,829
				Cohasset	2,800
				Shrewsbury	2,794
				Holliston	2,788
				Ayer	2,779
				Seekonk	2,767
				West Bridgewater	2,741
				Deerfield	2,739
				Bourne	2,672
				Hadley	2,666
				Hanover	2,666
				Hopedale	2,663
				Scituate	2,661
				Hatfield	2,630
				Norton	2,587
				Lancaster	2,585
				Kingston	2,580
				Swansea	2,558
				Wilbraham	2,521
				Holden	2,514

TABLE IV.—VALUE OF LEADING FARM PRODUCTS, CENSUS OF 1910

Product	Value	Leading County
Crops		
Hay and forage	11,281,000	Worcester
Vegetables, not including potatoes	6,190,000	Middlesex
Orchard fruits	2,074,000	Middlesex
Potatoes	1,994,000	Worcester
Small fruits	1,677,000	Plymouth
Corn	1,372,000	Worcester
Tobacco	1,218,000	Hampshire
Oats	157,000	Berkshire
Maple sugar and sirup	78,000	Franklin
Live stock		
Cattle	9,348,000	Worcester
Horses	8,672,000	Worcester
Poultry	1,493,000	Worcester
Swine	979,000	Middlesex
Sheep	156,000	Berkshire
Animal products		
Dairy products	15,188,000	Worcester
Eggs	4,280,000	Worcester
Wool	34,000	Franklin



New Haven, city and harbor, as seen from East Rock

GEOGRAPHY OF CONNECTICUT

By Henry T. Burr
Principal, Willimantic Normal School, Willimantic, Connecticut

EARLY HISTORY

The first settlement in Connecticut was made about 1614 by the Dutch, who sailed up the Connecticut River and established a trading post where the city of Hartford now stands. They chose this location because it was near the head of navigation on the river and therefore convenient for their purpose as traders. In 1633 English settlers from Massachusetts began to come to the same region. They were attracted by the strips of fertile land which border the river on both sides at this point. The first English settlements were made at Windsor, Wethersfield, and Hartford, and soon afterward the intervening territory was occupied. There was constant friction between the English settlers and the Dutch traders. The latter were soon outnumbered and finally withdrew, leaving the English in full possession.

English settlements were independently made at Saybrook in 1635 and at New Haven in 1638. Saybrook was chosen because of its situation at the mouth of the Connecticut River, which provided a harbor and offered easy access to the interior. New Haven was selected for its excellent harbor and also because of the broad lowland which lay to the north of it.

Other settlements soon developed along the shore both east and west of New Haven as well as in the central lowland. In 1662 these settlements were all united under the name of the Connecticut colony by a charter granted by King Charles II. The influence of geographical conditions in determining the location of the settlements of the colony is indicated by the fact that, of the first twenty settlements, ten were on the coast, six on the river, and two on both coast and river. The uplands were not settled until later, after the more favorable locations were largely occupied.

Connecticut undoubtedly owes its independent existence as a colony and later as a state to its geographical conditions. The fertile lowland which attracted the early settlers was separated from the Massachusetts Bay colony by over a hundred miles of

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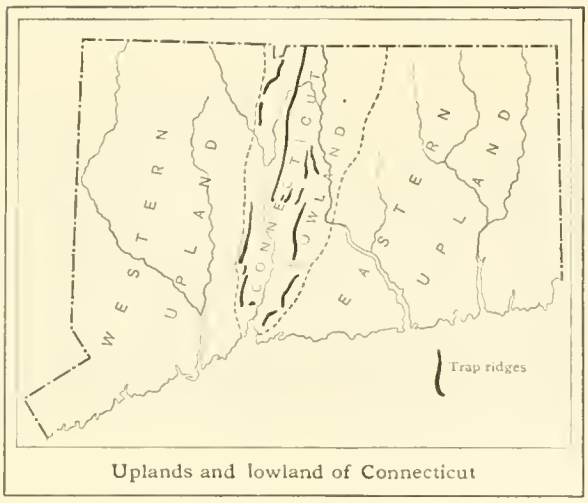


Uplands and lowland of Connecticut

rough wilderness, which, at that time, offered no inducement to settlers and was without roads other than Indian trails. Thus the Connecticut settlers soon became used to governing themselves, and Massachusetts made no determined effort to exercise authority over them.

POSITION, FORM, AND SIZE

Position and Form.—Connecticut is the southernmost of the New England states. It is roughly rectangular in shape, its length from east to west being nearly twice its breadth from north to south.

Size.—Connecticut is one of the smallest states. It occupies but one degree of latitude and a little less than two degrees of longitude. An automobile can easily go from Rhode Island on the east to New York on the west in less than a day, and the fast express trains running from Boston to New York cross it in about three hours.

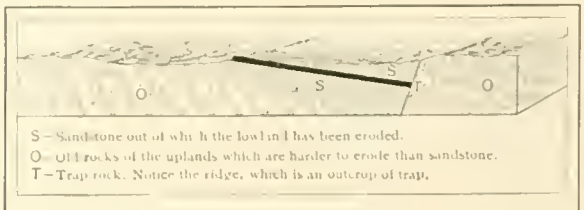
It is about four times the size of the neighboring state of Rhode Island, which is the smallest in the country. It is less than one sixth the size of Maine, the largest New England state, and it would take nearly fifty-four states the size of Connecticut to equal the area of Texas.

RELIEF

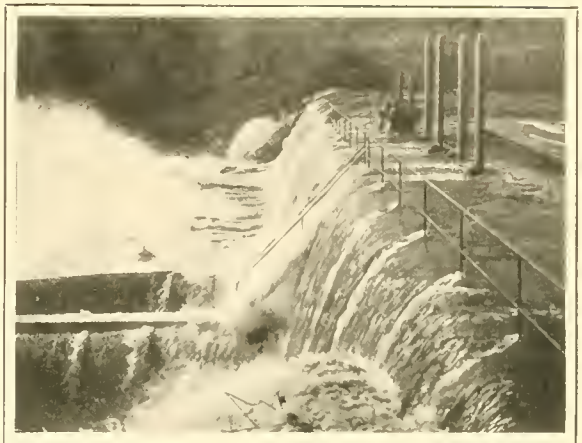
Uplands and Lowland.—Connecticut is divided into three parts,—an eastern upland, a western upland, and a broad lowland lying between. In a general way the uplands are alike. Each consists of numerous hills, rounded and smooth of slope for the most part but occasionally broken by rugged cliffs. Neighboring hills rise to the same general level. Very rarely does a single hill overtop the others near it. In general, the eastern upland is lower than the western. In both the heights increase gradually from the shore northward. The greatest altitudes of Connecticut are in the northwest corner of the state. Bear Mountain, in the extreme northwest, with a height of 2355 feet, is the highest peak.

The central lowland is underlaid by softer rocks than those of the uplands, and by weathering and erosion this region has been reduced to a nearly level plain. Some layers of trap, a lava rock, in the soft sandstone are harder and stand up as ridges above the general level. East Rock and West Rock at New Haven, the Meriden Hills, and the ridge running from Meriden to Mount Tom and Mount Holyoke in Massachusetts are of this character.

Glaciation.—Connecticut lies within the glaciated region. The great ice sheet moving southward over the hills smoothed them into the rounded forms that are now so common. The materials worn from the hills were spread over the lowlands. In places this material, known as till, was heaped


O
S
T
O
S—Sandstone out of which the lowland has been eroded.
O—Old rocks of the uplands which are harder to erode than sandstone.
T—Trap rock. Notice the ridge, which is an outcrop of trap.
Diagram showing a portion of the lowland and uplands in Connecticut

by the moving ice into rounded hills called drumlins. Such hills are found in Pomfret in eastern Connecticut and near New Britain in the central lowland. The streams from the melting glacier carried much sand and clay into the valleys and there deposited these materials. Much of the original soil produced by the weathering of the underlying rocks was removed and replaced by clay and other glacial materials which the ice brought from other places to the north. In places the glacial deposits acted as dams to form lakes. In other places they produced falls and rapids. Connecticut owes its many ponds and its fine water power to glacial action.



Dam in Farmington River, Tariffville

Coast.—The coast of Connecticut is rocky and irregular but lacks the cliffs and bold promontories of the northern New England coast. The irregularity of the coast line produces some excellent harbors. Those at New London, New Haven, and Bridgeport are the most important. Others, however, are used as ports for fishing boats, pleasure craft, and small coastwise vessels. New London harbor is the only one deep enough for large steamers.

DRAINAGE

The Connecticut is the longest and one of the most important of the New England rivers. It early formed one of the great trade routes of the region, first as a waterway and later as a route for railroads which extend along its banks throughout almost its entire length. Its falls and rapids have been dammed to furnish power to many mills. Its strips of flood plain and terraces afford, on the whole, the most fertile farm land in New England. It is navigable to vessels of moderate draft as far as Hartford, nearly fifty miles from its mouth. From the Massachusetts line on the north to Middletown it lies within the lowland. At Middletown it enters the eastern upland and flows to the sea in a narrow, picturesque valley.

The Housatonic River rises in the Berkshire Hills of Massachusetts, and traverses the western part of Connecticut from north to south. Its main tributary, the Naugatuck, furnishes water power for some of the most prosperous manufacturing cities in the state.

Connecticut Valley near Middletown. Notice where the river leaves the broad lowland and enters the upland

The Thames, really a tidal estuary rather than a river, is navigable to Norwich. Its mouth, at New London, forms one of the finest harbors on the Atlantic coast. Its head waters, the Shetucket, Quinnebaug, and Willimantic rivers, furnish abundant water power.

There are many ponds and small lakes, due, in most cases, to glacial obstructions in the river valleys. These are valuable as reservoirs which restrain the floods in rainy seasons and maintain the flow of the rivers in dry periods. Some have been enlarged for this purpose by dams built across their outlets. Many summer visitors are attracted to these lakes by their beauty and the opportunities for boating and fishing which they afford. Bantam Lake, in the towns of Morris and Litchfield, is the largest body of fresh water in Connecticut.

CLIMATE

The climate of Connecticut resembles that of the other New England states. It is cold in winter and warm in summer, but sudden changes of temperature are liable to occur in all seasons. There is less snowfall in Connecticut than in the northern New England states, and, except in the extreme northwest, the snow seldom lies on the ground for long periods.

Oyster vessels and shell heaps

The rainfall is, on the whole, abundant, reaching a yearly average of about forty-five inches. Dry spells are, however, not uncommon and are sometimes serious to the farmers and to those manufacturers who depend on water power. In fact, most factories which use water power have steam plants ready for use when the water power is not sufficient for their needs.

FORESTS, GAME, AND FISH

Forests.—A considerable portion of the state is covered with trees. The original forests, however, have been cut off and most of the trees now standing are of comparatively recent growth. Lumbering has, therefore, ceased to be a very important industry, although carried on in a small way in all parts of the state. The trees are largely oak, maple, chestnut, and other hardwoods, and scattering growths of the softwoods, particularly pine, hemlock, and cedar.

Game.—The larger wild animals excepting the deer have disappeared from Connecticut. The deer have been protected by law in recent years and have become very numerous. Small game is still fairly abundant in the uplands.

Fish.—Fishing is carried on in a small way at many of the shore towns, but there is no large market for fish in the state. The cultivation of oysters is an important industry at many places along the shore, and the total value of the product is considerable. The natural oyster beds which formerly existed in great numbers along the entire shore have become greatly depleted and are no longer used except for the gathering of young or "seed" oysters. These are planted in favorable localities and carefully cultivated until they reach marketable size. Shad fishing was formerly an important industry on the Connecticut River. It is still carried on, but the catch is growing smaller.

AGRICULTURE

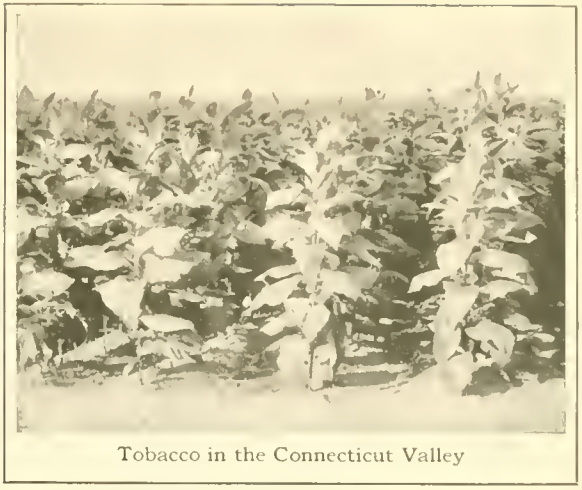
Soil.—The soil of Connecticut is largely glacial in its origin. It is often so full of bowlders that it cannot be profitably worked, and large areas are fit only for pasture and woodland. The rough stone walls so characteristic of New England hill farms bear witness to the heavy labors of the early settlers in clearing the land for tillage. The central lowland contains much good soil. It is composed largely of sand and clay washed from the glacier during its melting stages. This soil is not richer than the bowlder clay of the uplands, but is finer and more easily worked. The level or gently rolling surface of the lowland region is also a great advantage to the farmer, making possible the more extensive use of labor-saving machinery and reducing the cost of carrying his products to markets. Good farm lands are found in other parts of the state along the streams and in places among the hills.

Products.—The leading crops of the state, in the order of value, are hay, tobacco, potatoes, and corn. Tobacco is largely raised in a limited area in the northern part of the central lowland and in the vicinity of New Milford in the western part of the state. Connecticut tobacco is largely used for the outer layers or "wrappers" of cigars. The other three crops are rather evenly distributed over the entire state.

The large number of near-by markets, including those of Boston and New York, and the excellent railroad connections are great advantages to the Connecticut farmer. These make it profitable to engage in market gardening, dairying, and poultry raising. For the same reason flowers, nursery stock, and small fruits are extensively grown, largely on small farms near the cities.

MINING AND MANUFACTURING

Mining.—The rocks of the Connecticut uplands contain a great variety of minerals.

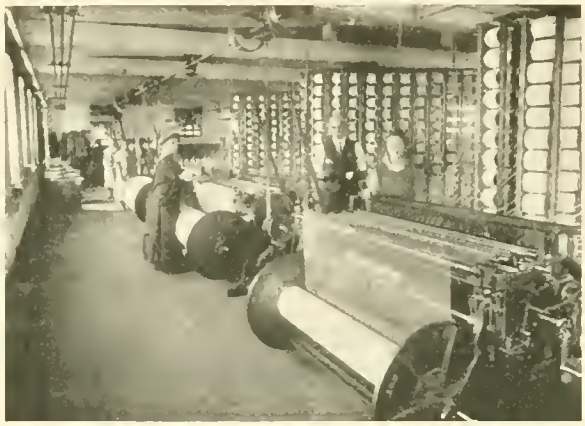


Tobacco in the Connecticut Valley

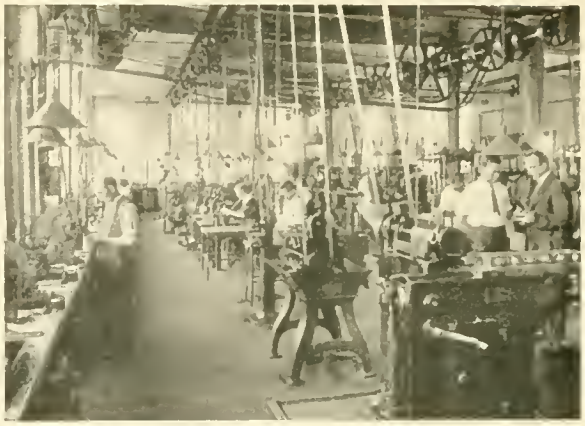
In former times copper, iron, and lead were mined. The deposits are not, however, in paying quantities, and the only mine now in operation is a small iron mine near Salisbury. This mine can be worked profitably in competition with the great iron ore deposits in other sections of the country because of the presence of manganese in the ore. This unites with the iron in smelting and produces a very tough metal which is particularly adapted to the manufacture of car wheels.

Granite quarries are found in a number of places, notably at Stony Creek and Thomaston. Many small quarries scattered through the upland region produce a stone which is known locally as granite but which is really gneiss. It is an inferior stone which is used largely in foundations and walls of buildings.

The red sandstone of the Connecticut lowland, known commercially as brownstone, was formerly quarried extensively at Portland. Brownstone is, however, no longer in fashion as a building stone and the industry has dwindled. Feldspar is quarried at Glastonbury, Portland, and Haddam. It is used in the manufacture of porcelain. Kaolin, used for a similar purpose, is quarried in the town of Sharon. Limestone is quarried in North Canaan both for marble and for the manufacture of lime. The Capitol at Hartford is made of marble from these quarries.



Warping department of a cotton mill, Putnam



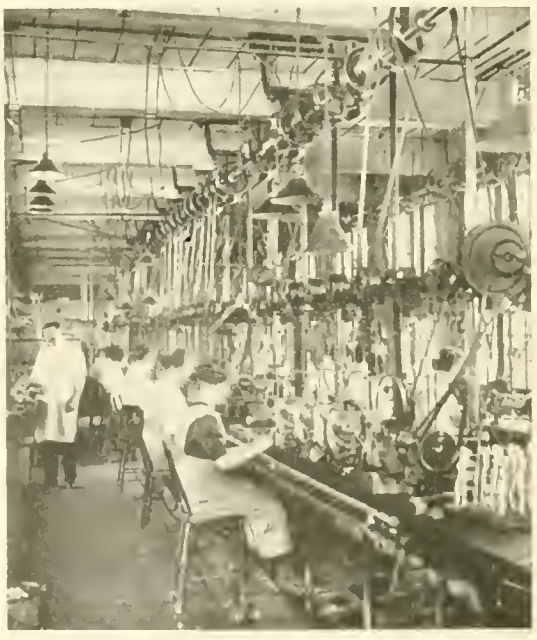
Typewriter factory, Hartford

Extensive deposits of brick clay are found in the lowland from the Massachusetts line to New Haven.

The hills of the lowland region afford an unlimited supply of trap rock. This is crushed and used for surfacing roads and building concrete walls.

Manufacturing. The chief wealth of Connecticut lies in its manufactures. When the great agricultural lands of the Middle West were opened to settlement, the Connecticut farms were unable to compete with the more productive farms of the West, and the people turned their attention largely to manufacturing. They were led in this direction also by the abundance of water power, and by the nearness of large cities where the products could be sold. The people seem to have been particularly adapted to manufacturing, and their inventive genius has become proverbial. In later years the railroads passing through Connecticut, between Boston and New York, have been important factors in the growth of manufacturing. In spite of the lack of raw materials, practically all of which have to be imported, the growth of manufacturing has been rapid and still continues.

The variety of manufactured products is very great even within the limits of each of the cities. In general, however, the area east of the Connecticut River is devoted to textile industries, while the central and western sections produce metal goods. Since the raw materials for the latter industries must be brought from considerable distances at heavy freight charges, it is found most profitable to produce goods which require considerable skill in manufacture, such as clocks, builders' hardware, cutlery, and firearms, rather than the bulkier metal products.



Clock factory, Thomaston

TRADE ROUTES

Long Island Sound is an important waterway for Connecticut. Steamers run daily from Connecticut ports to New York. There are also steamboat connections with Long Island. The Connecticut and the Thames rivers carry the Sound traffic inland.

The chief railroad routes lie along the shore and in the Connecticut lowland from Springfield in Massachusetts to New Haven. Along these routes it has been possible to build railroads without steep grades or sharp curves. Other important railroad lines follow the valleys of the larger streams. The Willimantic, Quinnebaug, and Thames in the east, the Farmington in the north, the lower Connecticut in the south, and the Housatonic and Naugatuck in the west are bordered by railroads. The only railroad line of importance which does not closely follow the larger rivers is the line which traverses the state from east to west through Willimantic, Hartford, Waterbury, and Danbury. In spite of its sharp curves and steep grades this road is important because it forms the shortest route between some of the large Connecticut cities and because it connects with railroads from the west.

Capitol, Hartford

As noted before, a part of Connecticut's industrial prosperity is due to its location on railroad lines between Boston and New York. Through trains between these two cities cross the state over three separate routes, and give nearly all the cities of the state direct access to these two great seaports. Two important freight routes from northern New England and Canada traverse the state, one passing through Palmer, Massachusetts, to New London, the other through Springfield to New Haven.

GOVERNMENT

The most striking feature of state governments in New England is the importance of the local unit, or town. Annually the legal voters of each town gather together in a town meeting to elect officers, to lay taxes, and to determine the policy of the town for the coming year. The chief officers are the selectmen.

When the population of a town becomes so large that its problems become too complicated to be dealt with in a popular assembly, the town or, in some cases, the populous section of the town applies to the legislature for a city charter. City governments are not uniform even for cities of the same size. In general, however, provision is made for a representative body known as the city council or board of aldermen, which is elected by the people and makes laws or ordinances for their government. A mayor is also elected, whose duty it is to see that the ordinances are carried out.

A borough, in Connecticut, is a unit of government intermediate between that of the town and the city. Its chief executive is called the warden and its legislative body the burgesses. The borough officers are not given so much authority as are those of the city, and the popular assembly is retained.

The strong tendency, to preserve the influence of the town in Connecticut, is shown in the manner of choosing representatives to the state legislature. This consists of two

Connecticut Agricultural College, Storrs

legislative bodies, the senate and the house of representatives. No town may elect more than two representatives to the latter body. Thus New Haven, with its large population, has no more representatives than the smallest town in the state with a population of less than four hundred. The senators are chosen by senatorial districts, which are made as nearly equal in population as possible. Thus the Connecticut senate represents the people; the house of representatives, the towns.

The legislature makes the laws by which the state is governed. The enforcement of the law is intrusted to the executive department, of which the governor is the head. Other officers of this department are the lieutenant governor, the secretary of state, the treasurer, and the comptroller. The latter two officials look after the state's financial affairs. Boards or commissions are appointed to carry out important activities of the state. Among these are the board of education, the board of agriculture, the board of health, the public utilities commission, the workmen's compensation commission, and the highway commissioner.

The judicial department of the state consists of a supreme court, a superior court in each county, and justice courts in each town for minor affairs. Other courts are established for special purposes.

The state is divided into eight counties. The county is, however, in Connecticut, of very slight political importance. The chief officials in the county are the county commissioners.

EDUCATION

The educational interests of the state are in the hands of the state board of education. The executive officer is the secretary of the board. In accordance with the strong feeling in Connecticut for local self-government, the towns are allowed much freedom in conducting their schools, but the state board has many important powers.

The state maintains four normal schools for the training of teachers. These schools are located at New Britain, Willimantic, New Haven, and Danbury.

Connecticut Agricultural College, situated at Storrs, about eight miles north of Willimantic, is maintained by the state in conjunction with the national government.

Connecticut does not maintain a state university. It contains, however, four endowed institutions of this rank,—Yale University at New Haven, Wesleyan University at Middletown, Trinity College at Hartford, and Connecticut College for Women at New London.

Yale University is, with the exception of Harvard, the oldest in New England. It was founded at Saybrook in 1701 and moved to New Haven in 1717.

Hartford Theological Seminary at Hartford and Berkeley Divinity School at Middletown are important institutions for training ministers and religious workers.

POPULATION AND CITIES

Connecticut has a population of over 1,100,000. If the people were evenly distributed over the whole state, there would be 231 to each square mile. Rhode Island, Massachusetts, and New Jersey are the only states in the country more densely populated.

The early population of Connecticut was

almost wholly of English descent. Within the last half century, however, immigrants from other parts of Europe have entered the state in large numbers. At first these came from northern and western Europe, but the later comers are largely from eastern and southern Europe. According to the last census over one quarter of the people of Connecticut were born in foreign countries.

The great industrial development of the last fifty years has tended to draw the native population also toward the cities. Thus the rural towns have grown very slowly or even, in some cases, have diminished in size. The cities, on the other hand, have had a rapid growth which still continues. About two thirds of the population of Connecticut now live in cities of 10,000 or more inhabitants. New Haven, Bridgeport, Hartford, and Waterbury, the four largest cities, have a combined population of about 400,000, which is more than one third of the total population of the state.

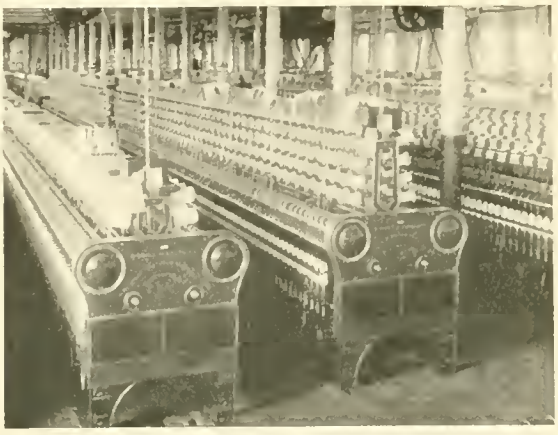
Coast Cities. — The two largest cities of Connecticut, New Haven and Bridgeport, owe their growth very largely to their harbor facilities. New London is another coast city that possesses a good harbor.

New Haven is the largest city in the state and the second in the value of its manufactured products. With its harbor and exceptional railroad facilities, it is a trade center of importance. Its principal manufactures are hardware, plumbers' supplies, firearms, steam boilers, machinery, and other products of iron, steel, and brass. It is the seat of Yale University, long a powerful influence in the affairs of the state and in the educational world. The Green, fronting the university, in the heart of the city, with its row of historic old churches and its beautiful elms, is nearly as famous as the university itself.

Buildings of Yale University, New Haven

Bridgeport, the first city in Connecticut in value of its manufactures and the second in population, is situated about seventeen miles west of New Haven, on the best harbor in western Connecticut. It owes its growth to

Factory for making army supplies, Bridgeport



Thread factory, Willimantic

its harbor and to its location near New York on the main line of traffic. Its principal products are guns and other munitions of war, submarines, sewing machines, electrical machinery, graphophones, corsets, and metal goods of many kinds.

New London, at the mouth of the Thames, is located on one of the finest harbors on the New England coast. In the days of the whaling industry it was a great shipping center and still has a considerable trade by sea. It is on the main railroad line between New York and Boston and is the terminus of the Central Vermont Railway, which brings freight from northern New England and Canada.

New London is the center of a group of summer resorts. Connecticut College for Women is north of the city.

The chief manufactures of New London are quilts and silk goods. Across the harbor, in **Groton**, is a plant for the manufacture of fine marine engines especially adapted to submarines. The United States government is developing a submarine base here.

South Norwalk is engaged in the coastwise trade and has a variety of manufacturing interests. **Stamford** is noted for its manufacture of locks. The modern type of locks with the flat key originated here. At **Greenwich** are the beautiful homes of people whose business interests are in the city of New York.

Cities of the Central Lowland. — In colonial days, the fertile soil of the Central Lowland led to rapid growth of settlements. The level surface of this lowland encouraged the building of railroads through it, and these are now the chief advantage which this region presents to the manufacturer.

Hartford, the state capital, is situated near the center of the state, at the head of navigation on the Connecticut River. Its fine capitol, with its beautiful park sloping toward the heart of the city; its many public buildings; and its broad and well-kept streets make it a very attractive city.

It is an important manufacturing city and one of the great insurance centers of the country. Its manufactures include machinery, firearms, typewriters, rubber tires, nails and screws, and other metal goods.

Railroads radiate from Hartford in all directions. These lines and the navigable river make it an important trade center. The fertile farm lands and the smaller manufacturing towns which surround it bring it much local traffic and help support its fine retail stores. Among the educational institutions located in Hartford are Trinity College and the Hartford Theological Seminary.

Next to Hartford the largest city in the lowland is **New Britain**, known as the "Hardware City." It manufactures a wide variety of metal goods, including builders' hardware, locks, cutlery, aluminum ware, screws, tools, and machinery.

Meriden, about halfway between Hartford and New Haven, is known especially for its silver-plating industries. It manufactures also lighting fixtures, cutlery, electrical appliances, and other metal products. The Connecticut School for Boys, a reformatory institution, is located here. **Wallingford**, near Meriden, also manufactures plated ware.

North of Hartford on the river are the manufacturing towns of **Windsor, Windsor Locks**, and **Enfield. Thompsonville**, in the town of Enfield, is noted for its carpet works.

East of Hartford is **South Manchester,** noted for its great silk mills. Still farther east, on the edge of the upland, a small stream falling to the valley below furnishes unusually fine water power to the city of **Rockville.** This is a textile city, manufacturing both cotton and woolen goods.

Middletown, at the bend of the Connecticut where it enters the eastern upland, manufactures hydraulic machinery, rubber goods, and textiles. Wesleyan University is located here. Near the city is a state hospital for the insane. Across the river is **Portland,** with its great brownstone quarries.

Bristol is situated on the western edge of the lowland where the Pequabuck, a tributary of the Farmington, issues from the hills. It makes iron castings, clocks, fishing rods, and a variety of metal goods. **Collinsville,** farther north on the Farmington River, manufactures tools.

Inland Cities of Eastern Connecticut.—The inland cities of eastern Connecticut are engaged chiefly in the manufacture of textiles.

Norwich, at the head of navigation on the Thames, is a prosperous manufacturing city. The Yantic and Shetucket rivers, which unite at this point to form the Thames, are swiftly flowing streams which furnish abundant water power. The chief manufactures are cotton textiles.

Norwich has a beautiful memorial library and art gallery. On the river, below the city, is a state hospital for the insane.

Willimantic, sixteen miles north of Norwich, is widely known as the "Thread City." In addition to thread, it manufactures cotton cloth and silk and velvet goods. It owes its location to the fine water power developed in the Willimantic River.

Grosvenordale, Putnam, Danielson, Plainfield, and **Jewett City,** in the eastern end of the state, are largely engaged in the manufacture of textiles.

Cities of the Naugatuck Valley.—The cities of the Naugatuck Valley are largely engaged in the manufacture of brass products.

Waterbury, the fourth city in population and the third in the value of its products, is located on the Naugatuck River at the junction of two important railroad lines. It is

Metal-working plant, Waterbury

the leading center of the brass industry of the United States. Its products include rolled and cast brass and copper, German silver goods, clocks and watches, copper wire, and plated ware.

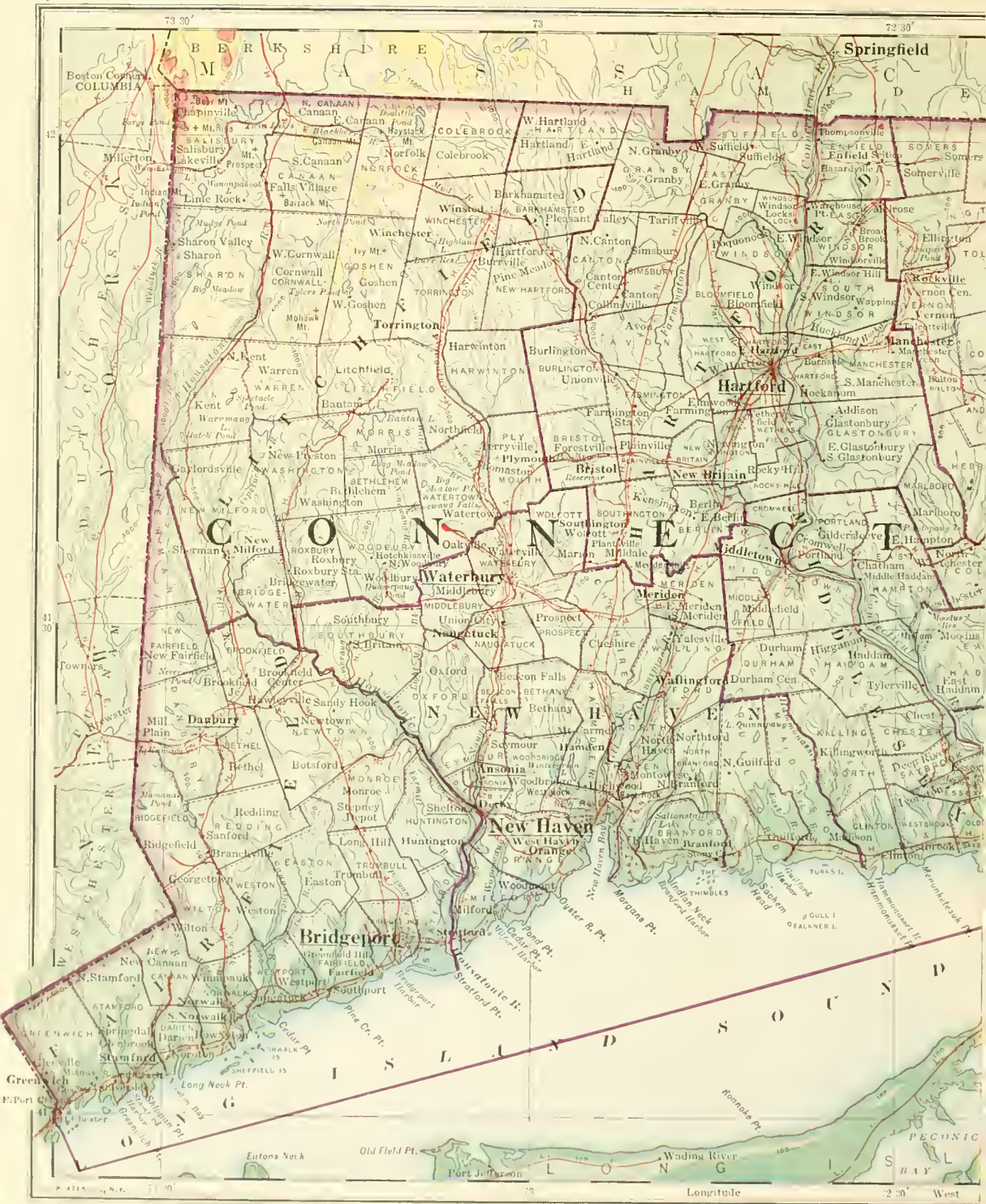
Torrington, in the north, produces rolled and sheet brass, needles, plated goods and castings. **Thomaston** has long been a center for the manufacture of clocks. **Naugatuck** and **Beacon Falls** produce rubber goods. **Ansonia** and **Derby** make heavy castings and brass products.

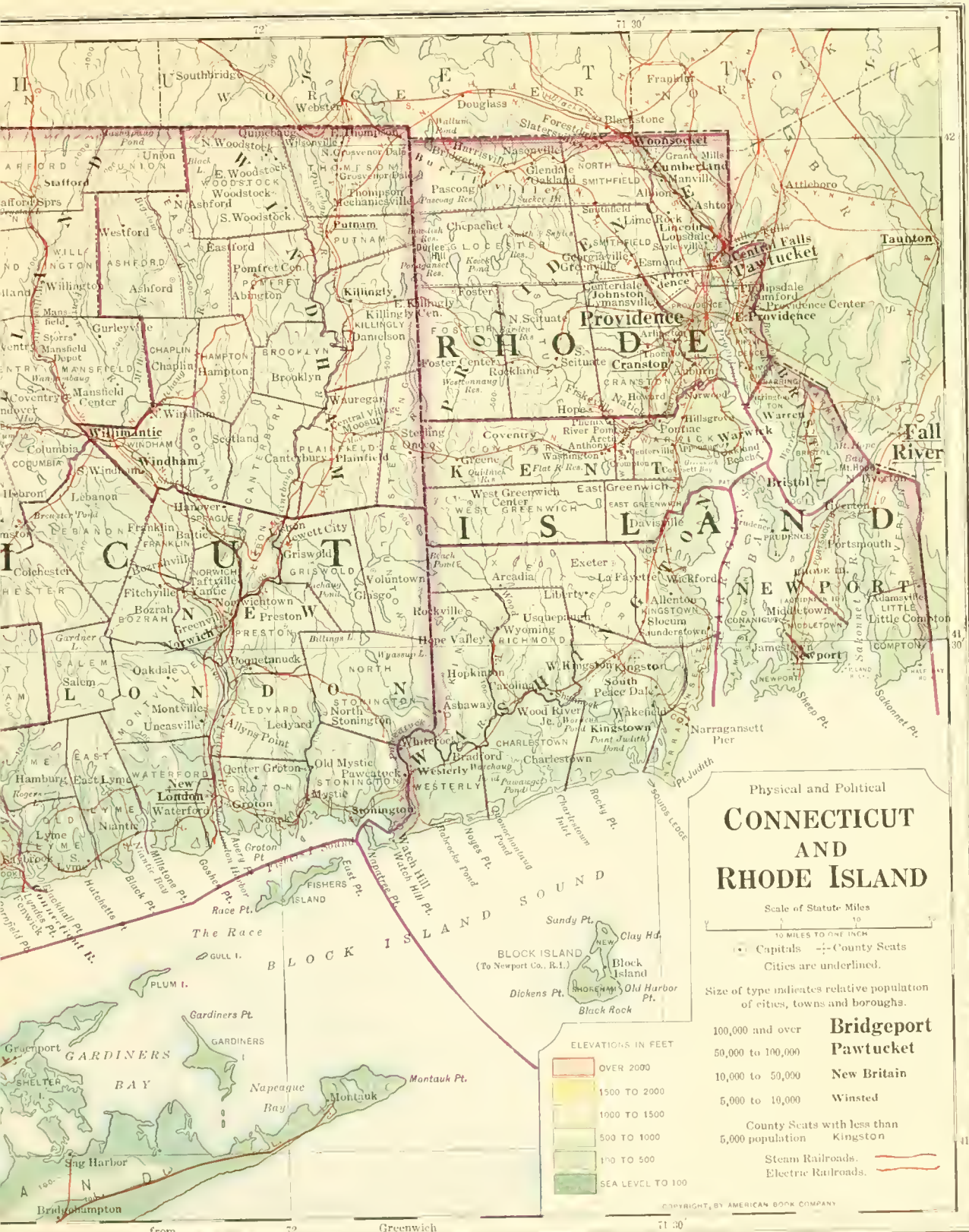
Inland Cities of Western Connecticut.—**Danbury** is the most important center in the country for the manufacture of hats. **Winsted,** in the northern part of the state, makes clocks, edged tools, and many other products.

CITIES AND BOROUGHS THAT HAD 2500 INHABITANTS OR MORE IN 1910

CITIES	POPULATION		CITIES	POPULATION	
	1915*	1910		1915*	1910
New Haven	147,005	133,605	Rockville		7,077
New London	20,771	16,659	Ansonia	16,453	15,152
Hartford	108,969	98,915	Derby	9,548	8,091
Middletown	13,044	11,851	Norwalk	26,466	24,054
Norwich	21,128	20,367	Stamford	29,058	25,138
Bridgeport	118,434	102,054	Willimantic	12,438	11,230
Waterbury	84,745	73,141	Putnam		6,037
Meriden	28,829	27,265	Bristol	15,536	9,527
New Britain	52,203	43,916	Shelton		4,807
Danbury	22,182	20,234			
BOROUGHS			BOROUGHS		
Bethel		3,011	Torrington	17,610	15,483
Wallingford	9,719	8,990	Southington		5,734
Danielson		2,934	Branford		2,560
Greenwich		3,860	Naugatuck	13,872	12,722
Fair Haven East			Jewett City		5,023
Stafford Springs		3,050			

* Estimates of U. S. Census Bureau


CONNECTICUT
Springfield
Hartford
New Britain
Bristol
Waterbury
Meriden
Middletown
New Haven
Bridgeport
Stamford
Norwalk
Danbury
Torrington
Manchester
Rockville
Enfield
Suffield
Windsor
Windsor Locks
East Windsor
South Windsor
Glastonbury
East Glastonbury
South Glastonbury
Wethersfield
Newington
Berlin
East Berlin
Cromwell
Portland
East Hampton
Chatham
Middle Haddam
Marlboro
Colchester
Lebanon
Columbia
Coventry
Mansfield
Willimantic
Windham
Thompsonville
Somersville
Somers
Ellington
Vernon
Vernon Cen.
Talcottville
Tolland
Rockville
Manchester
Burnside
East Hartford
Hockanum
South Manchester
Addison
Glastonbury
Farmington
Unionville
Burlington
Harwinton
Litchfield
Bantam
Kent
Warren
North Kent
Washington
New Preston
Gaylordsville
Bethlehem
Watertown
Oakville
Woodbury
Roxbury
Hotchkissville
New Milford
Sherman
Bridgewater
Middlebury
Southbury
Union City
Naugatuck
Prospect
Cheshire
Yalesville
Wallingford
Durham
Durham Cen.
Higganum
Haddam
Tylerville
East Haddam
Moodus
Chester
Killingworth
Deep River
Essex
Saybrook
Old Saybrook
Clinton
Madison
Westbrook
Guilford
North Guilford
Branford
Stony Creek
Thimble Islands
Sachem Head
Indian Neck
Branford Harbor
Morgans Pt.
Oyster R. Pt.
Pond Pt.
Cedar Pt.
Milford
Stratford
Stratford Pt.
Bridgeport Harbor
Pine Cr. Pt.
Cedar Pt.
Long Neck Pt.
Greenwich
Port Chester
Rye
Sheffield Is.
Captain Is.
Norwalk Is.
Chimon Is.
Hammonasset R.
Menunketesuk Pt.
Hammonasset Pt.
Tuxis I.
Gull I.
Falkner I.
Ronnoke Pt.
Old Field Pt.
Wading River
Port Jefferson
Eatons Neck
Peconic Bay
Long Island Sound
Long Island
Boston Comm.
Millerton
Salisbury
Lakeville
Sharon
Sharon Valley
Lime Rock
Canaan
North Canaan
East Canaan
South Canaan
Falls Village
Barrack Mt.
Norfolk
Colebrook
Winsted
Winchester
Winchester Center
Barkhamsted
Pleasant Valley
New Hartford
Pine Meadow
Canton
Canton Center
Collinsville
Simsbury
Tariffville
West Simsbury
Granby
East Granby
North Granby
Suffield
West Suffield
Windsor Locks
Poquonock
East Windsor
Windsorville
Warehouse Pt.
East Windsor Hill
Broad Brook
Melrose
Wapping
Huckleberry Hill
Avon
Farmington
Plainville
Forestville
Terryville
Plymouth
Thomaston
Watertown
Southington
Wolcott
Plantsville
Marion
Middlefield
Middletown
Durham
Yalesville
Cheshire
Prospect
Beacon Falls
Bethany
Oxford
Seymour
Ansonia
Derby
Shelton
Huntington
Monroe
Botsford
Newtown
Sandy Hook
Hawleyville
Redding
Ridgefield
Branchville
Georgetown
Easton
Trumbull
Long Hill
Stepney Depot
Woodmont
West Haven
Orange
Woodbridge
West Rock
Hamden
Mt. Carmel
North Haven
Northford
Montowese
North Branford
Saltonstall Lakes
Wilton
Weston
New Canaan
Winnipauk
Noroton
Darien
Rowayton
Springdale
Glenbrook
Old Greenwich
Mianus
Riverside
Cos Cob
Byram
Port Chester
Mill Plain
Brookfield
Brookfield Center
New Fairfield
Sherman
Roxbury Sta.
Woodbury
Quassapaug Pond
Lake Waramaug
Bantam L.
Mohawk Mt.
Barkhamsted Res.
Colebrook Res.
Highland L.
Crystal L.
Mudge Pond
Indian Pond
Wononpaukook Mt.
Bear Mt.
Chapinville
Canaan Mt.
Prospect
Ivy Mt.
Cornwall
Cornwall Bridge
Goshen
West Goshen
Torrington
Harwinton
Litchfield
Bantam
Kent
Warren
Northfield
Morris
Bethlehem
Washington
New Preston
Gaylordsville
Sherman
New Milford
Roxbury
Hotchkissville
Woodbury
Bridgewater
Middlebury
Southbury
Union City
Naugatuck
Prospect
Cheshire
Yalesville
Wallingford
Durham


Physical and Political
CONNECTICUT AND RHODE ISLAND
Scale of Statute Miles
10 MILES TO ONE INCH
Capitals
County Seats
Cities are underlined.
Size of type indicates relative population of cities, towns and boroughs.
100,000 and over Bridgeport
50,000 to 100,000 Pawtucket
10,000 to 50,000 New Britain
5,000 to 10,000 Winsted
County Seats with less than 5,000 population Kingston
Steam Railroads.
Electric Railroads.
ELEVATIONS IN FEET
OVER 2000
1500 TO 2000
1000 TO 1500
500 TO 1000
100 TO 500
SEA LEVEL TO 100
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Providence
Newport
Bridgeport
Hartford
New London
Waterford
Norwich
Willimantic
Windham
Putnam
Killingly
Danielson
Woonsocket
Pawtucket
Central Falls
Cumberland
Attleboro
Taunton
Fall River
Bristol
Warren
Warwick
Westerly
Stonington
Mystic
Groton
Block Island
Montauk Pt.
Gardiners Bay
Napeague Bay
Sag Harbor
Bridgehampton
Long Island Sound
Block Island Sound
Fishers Island
Plum I.
Gull I.
The Race
Watch Hill Pt.
Point Judith
Narragansett Pier
Sakonnet Pt.
Sandy Pt.
Clay Hd.
Dickens Pt.
Old Harbor Pt.
Black Rock
Montauk Pt.
from Greenwich

Providence. View from Turk's Head Building

GEOGRAPHY OF RHODE ISLAND

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HISTORY

"To hold forth a lively experiment that a most flourishing civil state may stand and best be maintained with full liberty in religious concernments." This is the inscription written on the Capitol at Providence, and the sense of the motto is expressed frequently in the early history of Rhode Island. Previous to 1636, the area about Narragansett Bay was inhabited solely by Indians and they have left behind them as monuments the many names of the physical features of the state. It is recorded that the explorer Verrazano discovered Narragansett Bay in 1524 and that Adrian Block, who gave his name to Block Island, explored the bay in 1614. The first permanent settlement was not made until 1636, when Roger Williams, driven from Massachusetts because his opinions were intolerable to his neighbors, established near the headwaters of the bay a town which he called Providence, "for God's merciful providence to me in my distress." Soon after, other settlements were made at Newport and Portsmouth on the island which gives its name to the state and which is said by one authority to be named for the island of Rhodes and by another to have been named by its discoverer, Rhoode Eylanat, "red island." These settlements were later united under the name of Rhode Island and Providence Plantations.

The history of the state centers almost entirely about Narragansett Bay, and it is not strange that very early the colony had a navy of its own. Conscious of the intent of the founders, it resisted any imposition of taxation by the mother country, sinking in 1669 the armed sloop *Liberty* and in 1772 burning the *Gaspee*, vessels which had been sent by England to curb the activities of the inhabitants; and, in reality, these were the first overt acts of the Revolution.

Still jealous of her freedom, the state was the last of the thirteen states to enter the Union; and the strength and insistence of her sons in convention during the early years

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of the Republic maintained the integrity of the state and prevented its partition by Massachusetts and Connecticut. Once firmly established, however, the growth of the state has gone on with few interruptions, first as a farming community, then as a commercial district, and now as a manufacturing state.

POSITION AND SIZE

Position.—The southern shore of Block Island is about 8′ north of the 41° parallel, and the northeastern corner of the state extends about 2′ north of the 42° parallel. The southern point of the mainland, in the extreme southwestern corner, is in the latitude of 41° 6′ N. The east-to-west dimension of the state is somewhat less than the distance from north to south, and it lies wholly between the 71° W. and 72° W. meridians.

Size.—Rhode Island is the smallest state of the Union. From Providence at the head of the Providence River, one may reach Woonsocket on the northern border by train within a half hour, Westerly in the southwest in one hour and fifteen minutes, and the sail down the Bay to Newport consumes but two hours. Delaware, the next state in size, is nearly twice as large, while Texas, the largest in the United States, is 213 times the size of Rhode Island.

RELIEF AND DRAINAGE

Relief.—The upland region of southern New England, an uplifted plain, slopes from the Berkshire Hills in western Massachusetts and Connecticut and from the White Mountains of New Hampshire to the sea. Rhode Island's position in the southern margin of this upland, with no point fifty miles from the ocean, gives it a relatively low relief. The highest point in the state, Durfee Hill, near the northwestern corner, is 805 feet above the level of the sea, and only a small section, in the same general locality, is above 500 feet; while a much larger area, adjacent to the ocean and bay, is below the 200 foot contour line. Mount Hope, the scene of Indian wars during colonial days, is a knoll, 200 feet high, situated on an inlet of Narragansett Bay near Bristol. The surface of the state has a rolling character; the plain has been cut and worn by streams, leaving rounded hills and between them broad valleys, while the invasion of the great ice sheet during the glacial period covered the state with a layer of glacial drift, in which are many bowlders of great size. In places the glacial drift formed morainic hills. In addition to the hills of drift, the glacier left much material scattered in plains of faint relief, called sand plains, a good representative of which extends along the western side of Narragansett Bay from Providence to Warwick.

The most important part of the coast line of Rhode Island is the great indentation, Narragansett Bay, which extends two thirds of the way into the state. The south shore, facing the Atlantic, is low and slopes gradually under the water, so that vessels cannot approach the land except where a river, as the Pawcatuck, scours a channel across the continental shelf. Narragansett Bay was formed by the sinking of the land, which allowed the sea to enter the broad valley now occupied by the waters of the bay. In this broad valley were numerous hills which were not submerged in the subsidence and now extend their tops above the waters, forming the islands of Rhode Island.

Drainage.—The term "river" is applied in Rhode Island not only to rivers proper but also to the estuaries or great arms of the bay. Thus the Seekonk River is a narrow part of the bay extending from Pawtucket to Providence, Providence River is the northern and narrower portion of the bay, and the Warren and Barrington rivers are likewise estuaries. The true rivers of the state flow into Narragansett Bay, except the Pawcatuck which reaches the sea in the extreme southwestern corner of the state. The Blackstone River, rising twenty miles to the northwest

of Woonsocket in Massachusetts, flows into the Seekonk; the Pawtuxet, rising in the western part of the state and flowing through the center, flows into the Providence River; and the Pawcatuck, draining a large part of the southwestern part of the state in its lower reaches, forms the boundary line between Connecticut and Rhode Island.

The invasion of the ice during the glacial period brought to the state a great quantity of loose materials, which were deposited unevenly over the area when the ice melted. Many streams were turned from their former courses and found new pathways to the sea. In cutting down new channels these streams encountered bed rock which halted the erosion at various points, and as the softer materials on the downstream side were removed, falls were formed. Navigation is therefore not possible upon them, but the rivers are valuable as sources of power, especially the Blackstone and the Pawtuxet.

Besides turning many streams from their original beds, the deposition of glacial drift over the state blocked the headwaters of the streams and formed many small lakes. Rhode Island is dotted with lakes. Some are now used for water supply and some as camping sites. Many of these lakes were shallow and filled up quickly, forming swamps, which remain as undrained areas that sometime may be reclaimed to yield rich harvests of vegetables and fruits.

Climate.—The most important climatic control is latitude, and Rhode Island's position between the 41st and 42d parallels of north latitude gives to it a high sun and long days in summer with the consequent high temperatures, and a low sun and short days in winter with low temperatures. Prevailing winds and nearness to the sea are two other factors that determine its climate.

Rhode Island is located in the westerly wind belt (Secs. 61, 62), and the cyclonic storms (lows) and anti-cyclonic storms (highs) of this belt cause great variations in the seasonal temperatures. The proximity to the sea, although less influential on an east coast than a west coast under westerly winds, gives to the state fewer excesses of heat and cold than are experienced by an inland state. In Providence the average temperature of July is 73.4° and that of January is 27.2°, making an annual range of 46.2°; while at Block Island, the average temperature of July is 68.1°, and that of January is 31.4°, giving an annual range of but 36.7°. The difference between the annual range of these two places illustrates the influence of distance from the sea upon climate. Altitude causes only slight local differences, as the relief of the state is not great.

The growing season (Fig. 71), which is the time between the last killing frost in spring and the first killing frost in autumn, is longer in Rhode Island than in any of the other New England states. This period is shorter in the northern part of the state than in the southern part. The last killing frost sometimes occurs in March, but more frequently it comes in April; and the first killing frost is frequently as late as November. Especially along the coast of the state the modifying influence of the sea is felt, and though the winter days are at times bleak, they are never excessively cold. The influence of the sea in modifying temperature, however, is most potently marked in the summer, when the cooling influences of the ocean attract many summer visitors to the state and give a temporary increase to the population. Watch Hill, Narragansett Pier, and Newport stand out preëminently as summer resorts. The rainfall of the state is ample and is the heaviest along the ocean front, where over 45 inches per year is the average amount (Fig. 72). In the northern part of the state the annual rainfall is from 40 to 45 inches; while the extreme northwestern section receives 35 to 40 inches. The rainfall is fairly well distributed through the year, so that the soil is kept moist, and long-continued droughts are not common.

INDUSTRIES

A market garden near Providence

Agriculture.—Most of the soil in the state is of glacial origin. In the uplands it is of no great thickness, and frequently bare ledges are exposed, while over the lowland a greater depth prevails. As there are but small areas of alluvial soil, the greater part of the state has a rather coarse-textured soil. In the uplands the clay, usually in glacial soils, is absent, and the porous and stony character of the soil makes it less valuable than the lowland soil, which contains the clay. According to the soil survey nearly fifty per cent of the state has a light brown sandy loam, the most of this being too rough and too rocky for profitable tillage and best suited to forestry or to orcharding. About twenty-one per cent of the state's area has a mellow brown loam, the most productive soil in the state.

About two thirds of the area of the state consists of farm land, but only one fourth of the total area consists of improved farm land. It is estimated that about 400 square miles, or thirty-seven per cent of the state, is covered with trees, but the growth is not vigorous and most of the trees are too small for timber. A few patches of pines exist, and cedars fill many of the southern swamps, but most of the forest area is covered with hardwoods.

Hay is the leading crop of Rhode Island and potatoes are second in importance. Corn is the most important cereal crop. In the vicinity of the large centers market gardens have sprung up and have been uniformly successful. Providence and the towns in its immediate vicinity offer an extensive market for garden products, and in the southern part of the state the summer resorts make a good demand for vegetables and fruits grown in the adjacent areas. The state is considered a natural orchard area, but only small quantities of fruit are raised.

The most important farm animals of Rhode Island are horses, dairy cattle, and poultry. The large manufacturing centers and summer resorts furnish ready markets for milk, eggs, and poultry.

Mining.—The value of minerals exceeds the value of the agricultural output of the state, but does not equal in value the fisheries. The most famous product is granite, and Rhode Island stands ninth among the states in granite production. This stone is quarried in many places, but the real center of the industry is at Westerly in the southwestern part of the state. The Westerly granite has, because of its fine texture and color, found an extensive market for monumental work. Coal is mined in small amounts on Aquidneck Island, but it is of inferior quality.

Fishing.—Narragansett Bay offers a great extent of shallow water which has been used since the foundation of the colony as a fishing ground. Fishing gives occupation to only a very small percentage of the people of the state (one half of one per cent), but the yield is worth in money ten times the output of the farms. More than one half the value

of the fisheries comes from shellfish. Rhode Island clams are widely known and its oysters are shipped in great quantities. The oyster catch is valued at three fourths of a million dollars per year. Scup, squeteague, and lobsters are caught and form twenty-five per cent of the value of all products of this industry.

Making jewelry, Providence

Manufacturing. — Rhode Island is above everything else a manufacturing state, about fifty-five per cent of the working population being engaged in this industry.

The leading manufacturing industries of Rhode Island, in order of importance, are manufacturing of woolen and worsted goods, cotton manufacturing, dyeing and finishing of textiles, and the making of jewelry. To-day Rhode Island holds first rank among the states in the value of jewelry manufactured. The state ranks second in worsted goods, third in dyeing and finishing, and fifth in cotton goods.

Most of the raw materials for manufacturing come from afar. Rhode Island has no gold nor silver mines, no cotton fields, and but few flocks of sheep. It does, however, contain a densely settled district of skilled artisans. The disadvantage of distance from the sources of raw products is compensated by the abundance of skilled labor and by the nearness of markets for the finished products (Fig. 80).

Transportation. — All the railroads in Rhode Island belong to the New York, New Haven, and Hartford Railroad system (Page iv). By these lines Providence is connected with other cities and villages of the state and with other points in New England. One line runs from Providence westward into Connecticut, one extends northwestward to Pascoag and into Massachusetts, another runs northwestward to Worcester, and another southeastward to Fall River and Newport. One of the main railroads of this system connects Providence with Boston and New York.

From Providence extensive trolley lines parallel the railroads and carry on a heavy business in both freight and passenger traffic.

Providence is also the center of a coastwise traffic and is connected by boats with New York and Chesapeake Bay. One transatlantic line, the Fabre, from southern Europe, stops at Providence, and the state has recently erected a new state pier in the city in order to extend its facilities and attract trade. The bay during the summer months is filled with many kinds of vessels, and a fleet of steamers plies between the large resorts.

GOVERNMENT AND EDUCATION

Government.—The settlement of Rhode Island in somewhat isolated towns developed a purely democratic form of government in

Cotton mills, Manville

which every voter could have a hearing and a direct vote upon every issue. As soon as the town meeting became unwieldy, because of the increasing size of the town, cities organized under representative government. Groups of towns and cities are joined as counties for the holding of court sessions only.

The governor of Rhode Island, elected biennially, has less power than is granted governors of other states, inasmuch as the veto power is denied him. The legislature, called the General Assembly, is a small body; each town or city has one senator, making thirty-nine, and each has representatives according to the population, but the House is limited to a membership of seventy-two.

Education.—The public schools of Rhode Island consist of elementary schools, high schools, the Rhode Island State Normal School, and the Rhode Island State College. The state board of education and the commissioner of public schools have general supervision of the schools of the state. Some of the best features of the school system of Rhode Island are: the large number of professionally trained teachers, the length of the school term, evening schools for those who cannot attend day schools, and the introduction of industrial education, including agricultural education.

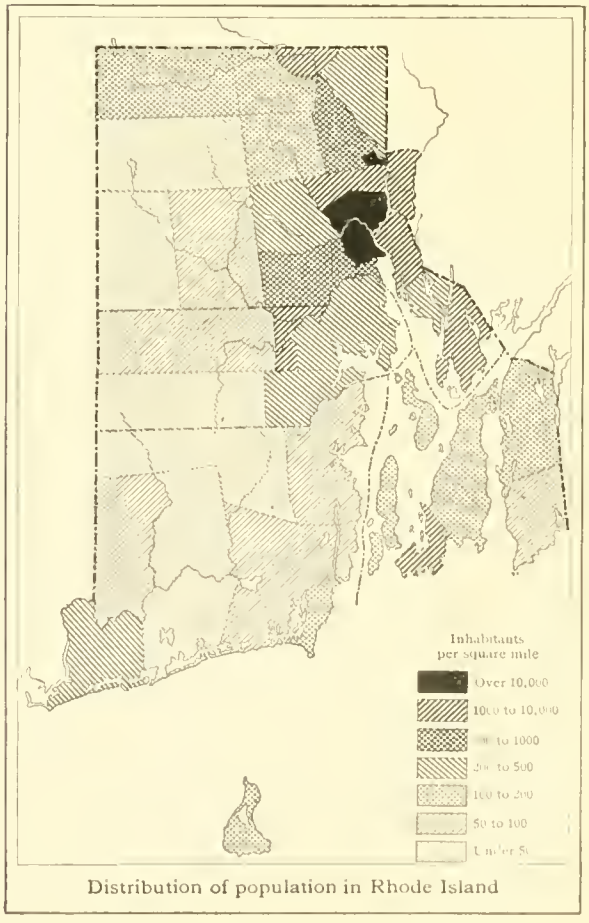
The Normal School trains teachers for the schools of the state. The State College offers courses in agriculture, engineering, and other applied sciences.

Brown University, an endowed institution, is one of the leading universities of the United States.

POPULATION AND CITIES

Population.—Rhode Island has a population of 542,610. Although it is the smallest state in the Union, there are ten states with a smaller population. If the people were distributed uniformly over the state, each square mile of area would contain 509 persons, and this density of population exceeds that of any other state of the United States. This high density is the result of the concentration of people in manufacturing centers. The six cities of the state contain 385,147 persons, or over seventy per cent of the entire population, and the total number of people in villages and cities of 2500 inhabitants or more constitutes 96.7 per cent of the population. This percentage of urban population is not exceeded by any other state of the Union. Two thirds of the population is native and one third is foreign born. The foreign white stock, including foreign born and those having one or both parents of foreign birth, exceeds two thirds of the total population.

Providence, at the head of the Providence River, is the largest city, the capital of the state, and the chief distributing center. It is the second city in size in New England.



Distribution of population in Rhode Island

Brown University, Providence

being exceeded by Boston. Providence is primarily a jewelry center. It is also noted for the manufacture of cotton, worsteds, high-grade tools, engines, and boilers. Besides being the center of the industrial life, Providence contains the state Capitol, Brown University, and the State Normal School.

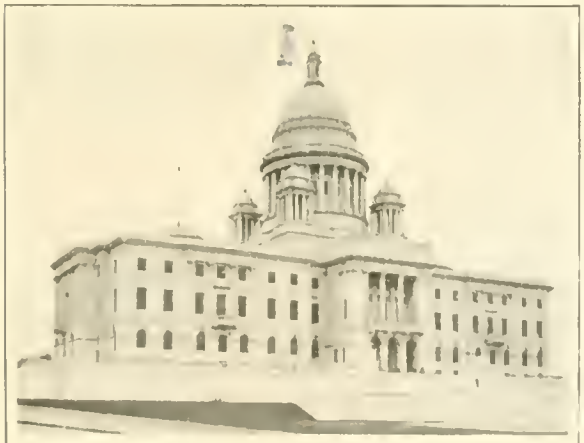
Pawtucket, the second city in population, is at the head of the Seekonk River, an arm of Narragansett Bay, and along the lower reaches of the Blackstone River. Cotton and worsted goods and machinery are manufactured.

Woonsocket, on the Blackstone and bordering Massachusetts, is noted for the manufacture of cotton and rubber goods.

Newport, once a famous port and the capital of the state, is noted as a summer resort. The United States War College and Naval Training Station is located here.

Cranston and **Central Falls** are manufacturing centers. The former is noted for bleaching, dyeing, and calico printing, and the latter for the manufacture of textiles.

Cotton goods are manufactured in **Lonsdale**, **Valley Falls**, **Manville**, **Warren**, **Warwick**, **West Warwick**, and **Westerly**. Chemical products are manufactured at **East Providence** and fish oil and fertilizers at **Tiverton**. **Bristol**, noted for ship building, has sent out many "cup defenders." **Kingston**, in the southern part of the state, is the seat of Rhode Island State College. **Block Island**, **Narragansett Pier**, **Jamestown**, and **Watch Hill** are famous resorts.



State Capitol, Providence

POPULATION OF COUNTIES, CITIES, AND TOWNS OF RHODE ISLAND, 1915

Bristol County	20,525	Cumberland	9,020
Barrington	2,982	East Providence	18,584
Bristol	10,302	Foster	1,076
Warren	7,241	Glocester	1,491
Kent County	38,866	Johnston	6,693
Coventry	5,669	Lincoln	10,140
East Greenwich	3,004	North Providence	6,780
Warwick	13,302	North Smithfield	2,805
West Warwick	15,782	Pawtucket (city)	55,535
West Greenwich	509	Providence (city)	247,600
Newport County	43,805	Scituate	3,342
Jamestown	1,518	Smithfield	3,284
Little Compton	1,382	Woonsocket (city)	40,075
Middletown	1,902	Washington County	20,703
Newport (city)	30,472	Charlestown	901
New Shoreham	1,413	Exeter	904
Portsmouth	2,078	Hopkinton	2,496
Tiverton	4,400	Narragansett	1,431
Providence County	405,937	North Kingston	5,931
Burrillville	8,086	Richmond	1,458
Central Falls (city)	23,708	South Kingston	5,497
Cranston (city)	20,940	Westerly	10,175
The State			595,986

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